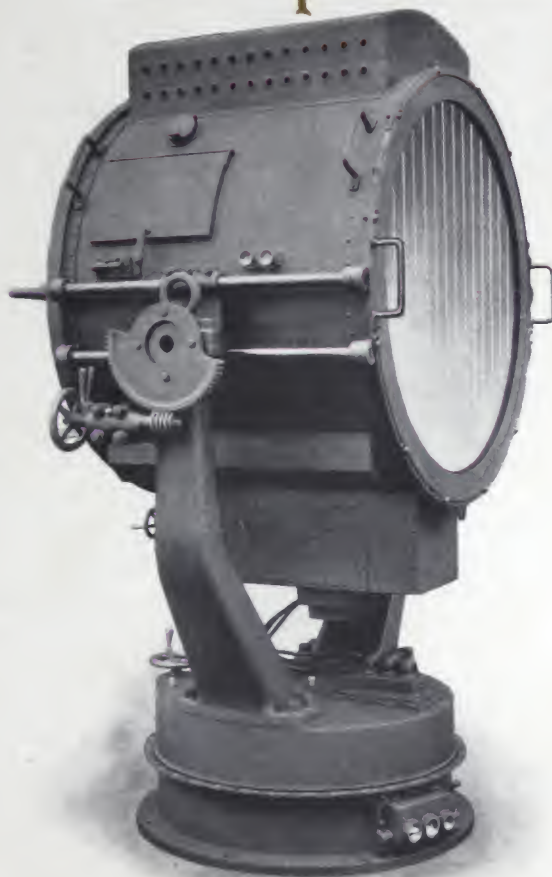


361-7.

Search Light Projectors



The Carlisle & Finch Co
Cincinnati Ohio.

1891-1892
1891-1892

1891-1892
1891-1892

SEP 4 1914

ELECTRIC SEARCHLIGHTS.

CATALOG "A"



SEARCH LIGHT PROJECTORS



1914

THE CARLISLE & FINCH CO.

229-231 East Clifton Avenue : : : CINCINNATI, OHIO

THE CARLISLE & FINCH CO.

ELECTRIC SEARCHLIGHTS.



THE CARLISLE & FINCH CO.

THE Carlisle & Finch Search Light Projectors have become so widely and favorably known that they are now generally specified in preference to all others. Constructed in a simple and substantial manner, with all parts as strong as possible, and so accessible that the working parts can be easily reached, they have rapidly displaced the older type of search lights, and have created a place for themselves that defies competition.

All parts are made in the most careful manner, and of the best material. Each search light, when it leaves the factory, is mechanically and electrically perfect; it has been put through a careful test, and has been operated for several hours to make sure every part is perfect.

The search lights and projectors are manufactured in a modern factory, and every piece is inspected and tested before it enters into the construction of the search light.

So popular have the Carlisle & Finch Search Lights become that they are now shipped to all parts of the world, and are used on every class of vessel, from the smallest launch to the vessels of the United States and foreign navies.

In addition to their use on shipboard, of late years, search lights have been used very largely in industrial operations, for lighting excavations for night work, for lighting cableways, stone and cement quarries, dams and bridge building, and each year sees their application more widely extended. Their field of usefulness is unlimited, and we will later on devote a few pages to this particular phase of their application.

The Carlisle & Finch Search Lights are made in all sizes, from 7 inches diameter to 60 inches diameter.

Dispersion Lenses

Sometimes called "divergers," consist of strips of plano-convex glass set in a suitable frame for slipping over the front of the projector, or arranged to swing across the light to one side, as described on page 37. Their object is to cause the light to spread out horizontally in order to illuminate a larger area. At the same time the light does not spread vertically, but forms a wide ellipse. This is of the utmost importance for some classes of service, especially for towboats and tugs. These dispersion lenses may be applied to any type search light and are readily removable, so that a long, narrow beam of light is available if desired.

Marine Search Light Projectors

We have adopted the name "projector" to distinguish the more powerful type of search light, which is equipped with glass lens mirror. The name "search light" will be used in this catalogue to indicate the search light with silvered spun copper reflector.

We have embodied in our Marine Projectors all the latest improvements to be found in this class of apparatus.

For lake and seagoing vessels, projectors possess many advantages over the lights using silvered copper reflectors. The great accuracy of curvature of the mirrors produces a light of greater carrying power, which will render objects visible at over twice the distance possible with the silvered copper reflectors.

The general arrangement of mirror and carbons will be readily seen by referring to the several illustrations following.

Owing to the peculiar position of the carbons, all the light produced at the arc is cast upon the mirror, and is then both reflected and refracted, so that it emerges from the lamp in a practically straight ray. A focusing screw and handwheel are provided for varying the spread of the light.

The mirror is contained in a spun copper, bowl-shaped receptacle, which protects it from moisture and damage.

The weight of the projector is carried on a train of steel balls. The friction is thus so reduced that the lamp may be turned in either direction with the greatest ease.

The most important requisite of a projector is that it be reliable. To this end we have carefully designed all the parts of our projectors. The base is made broad and heavy, and is of such width that the projector does not look topheavy, but on the contrary, presents a most symmetrical appearance, as will be seen by referring to the illustrations.

The upper part of the base is hollow and swivels on a stout pivot on the lower portion, thus allowing the projector to be swung horizontally. The contacts for conducting the current to the lamp mechanism are in this upper part, and make contact on two brass rings, fastened to, but insulated from the lower casting. The overhanging lip of the upper casting protects these contacts and the steel balls from dirt and moisture.

The projector may be turned in a continuous circle, and there are no wires to be twisted off in so doing.

The standards are made separate and bolted onto the base. If, from any cause, they should become broken, they can be easily replaced, and will not necessitate a complete new lower frame.

The case or cylinder is made of heavy sheet metal. Each end is riveted into a polished cast brass ring, of which the hinges form a part. The doors are similar castings, which fit closely over the castings at each end of the cylinder.

The most durable construction is the all-brass projector in which the case, stand and base are made of brass. We list this as the "polished brass" finish, although it can be finished dead black if preferred, at the same price.

The projector with "brass case and iron stand" costs less and will give very good results. The "white enameled iron" finish is

the cheapest and consists of a sheet-steel case with brass rings and trimmings and a cast-iron stand and base. It is finished in white enamel and will stand the weather quite well.

Carbon Feeding Mechanism



This type of mechanism has had eighteen years use under the most severe and trying conditions, and while numerous improvements have been made from time to time, the principle and operation are the same. It has been tried and proven, and a better one has not yet been produced.

It is without doubt the most accurate and sensitive carbon-feeding mechanism used in any projector. The carbon carriers are supported on two parallel brass rods, and are moved towards each other by means of a right and left screw. This screw is actuated by a shunt magnet, and the length of the arc is maintained absolutely uniform, no matter in what position the mechanism is placed. No other projector possesses such an accurate and reliable method of feeding the carbons together as they are consumed.

All parts of the mechanism are below the metal shield, and the slender carbon holders are the only parts which are in the line of the light.

The carbon-feeding mechanism in all of our present style of marine projectors HAS BOTH AUTOMATIC FEED AND HAND FEED; EITHER ONE CAN BE USED INDEPENDENTLY.

A balancing or steadying resistance is necessary, and must be connected in series with the carbon-feeding mechanism. The

voltage across the arc is usually 50 volts, and the remainder of the voltage is absorbed by the resistance.

It has not been found practical to use lower than 60 volts line voltage with good results; 100 volts to 125 volts is best.

Mirror



Our mirrors are of the highest quality. They are similar to those used by the United States Navy. They are ground to the truest possible curvature, and the light thrown by them is a remarkably smooth and solid beam. They stand the service well. All projectors up to 19 inches, inclusive, are fitted with Mangin Mirrors; while the 24-inch and larger are fitted with Parabolic Mirrors.

Rheostats



Rheostats are made for 125-volt circuits, unless otherwise ordered. They are made of cast iron and wound with an ap-

proved non-corrosive resistance wire. Asbestos and mica are used for insulation, and they are fireproof in every sense of the word. They are covered with a light, perforated sheet-iron cover. The space occupied by each rheostat is 10 inches by 14 inches. The height varies from 5 inches, for the smallest, to 18 inches for the largest.

Standard Equipment for Marine Projectors

Each projector is furnished complete with rheostat for 125 volts or less, canvas cover and six pairs of carbons. It is all ready to have the wires run to it, and no extras are necessary.

Effective Range

We are often asked how far it is possible to distinguish objects with our projectors. This depends altogether on the color and size of the objects, and the condition of the atmosphere. On perfectly clear, dark nights, the 7-inch projector will illuminate objects at about $\frac{1}{2}$ mile; the 9-inch projector, $\frac{1}{2}$ to $\frac{3}{4}$ of a mile; the 14-inch projector, 1 to $1\frac{1}{2}$ miles; the 19-inch projector, $1\frac{1}{2}$ to 2 miles; the 24-inch projector, 3 miles; the 32-inch projector, 4 miles; the 38-inch projector, 5 miles. Under the most favorable conditions, the range may exceed the distances given.

We are aware that some manufacturers claim their apparatus will throw an effective beam of light greater distances, but we prefer to be conservative in our claims, and not deceive our customers by exaggerating.

Classification

We classify our search lights and projectors as follows:

The FORM 1 is the plain, hand-controlled lamp to be directed by a man standing back of it and moving it in the direction he wants the light to point.

The FORM 2 is equipped with distant cable control, so that it can be placed at the bow of the vessel, and its motion controlled from the pilot house or bridge.

The FORM 3 is intended to be placed on top of the pilot house and controlled from within by means of handwheels turning in a horizontal plane and operating through concentric vertical shafts.

The DECK TYPE is similar to the Form 1, but it has a higher base or stand, so as to bring the center of the cylinder or base in line with a man's chest, making it convenient for operating, and also high enough to clear most obstacles on the vessels.

The DISTANT-CONTROLLED TYPE has mechanical distant control through concentric horizontal shafts and bevel gears to the search light.

FORM 1-M

7-inch Projector

The smallest size projector we make is 7 inches in diameter, and it is made for actual use. It is not a plaything to look at, but a powerful projector, which will throw a good beam of light for half a mile or more.

It is fitted with a 7-inch Mangin Mirror. The carbon-feeding mechanism is similar to the one we use in our large projectors, and is the latest improved screw-feed type, operated by a shunt magnet. The feed is positive, and the projector will burn in any position.

We are manufacturing this 7-inch Projector in five styles: the Form 1-M, the Form 3-M, the Deck Type, the Bulkhead Type, and Distant-Controlled Type.



The Form 1-M is to be directed by hand, and has a clamp on the right-hand trunnion for locking the cylinder in any position. All parts are made of brass, highly polished.

Current consumption, from 3 to 5 amperes. Candle power, from 1,000 to 1,500. The voltage must be at least 60 to obtain good results, and a higher voltage is better.

The projector is furnished with canvas cover, rheostat, and six pairs of carbons. Made of brass throughout.

Price List—Form 1-M, 7-inch

Polished Brass	Height to Center of of Mirror, Inches	Weight, lbs.	Code Word	Size of Carbons
\$110.00	12	17½	Nug	J

For sizes of Carbons see page 51.

For dimensions see page 61.

ELECTRIC SEARCHLIGHTS.

FORM 3-M

7-inch Projector

The Form 3-M Projector has the same powerful controlling gear as is used on our large search lights and projectors. It consists of an outer tube, attaching directly to the revolving stand, and an inner rod with small pinion on the upper end, which engages directly with a small gear segment on the search light cylinder. Both the tube and rod are operated by polished brass handwheels, which are within easy reach of the steersman. A reference to the accompanying illustration will show the method of operation more clearly.



The mechanism, mirror, stand, and the entire construction are the same as the Form 1-M.

The current consumption is from 3 to 5 amperes, and requires a voltage of 60, or over. A canvas cover, rheostat, and six pair of carbons are included in the shipment. Made of brass throughout.

Price List—Form 3-M, 7-inch

Polished Brass	Height to Center of Mirror, Inches	Weight, Lbs.	Code Word	Size of Carbons
\$135.00	12	20	Nat	J

For dimensions see page 61.

Price List—Deck Type

Polished Brass	Height to Center of Mirror, Inches	Weight, Lbs.	Code Word	Size of Carbons
\$135.00	44	35	Nick	J

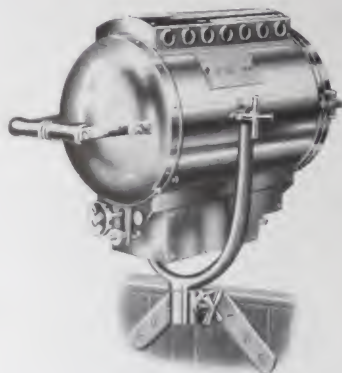
For dimensions see page 61.

For sizes of Carbons see page 51.



7-inch Projector

Bulkhead Type



We have had many calls for a projector arranged to be mounted on the bulkhead in a launch, and the type of lamp illustrated above has been brought out to meet the demand. The construction is strong and simple, and the projector is very easily controlled from this position. It is fitted with Mangin Mirror.

A canvas cover, rheostat for 125 volts or less and six pair of carbons are included in the equipment. Made of brass throughout.

Price List—Bulkhead Type

Polished Brass	Weight, lbs.	Code Word	Size of Carbons
\$110.00	17½	Wad	J

Price List—Distant Controlled Type

Polished Brass	Weight, lbs.	Code Word	Size of Carbons
\$190.00	35	Wedge	J

For size of Carbons see page 51.

FORM 1-M
9-inch Projector



This is a more powerful projector than the 7-inch size previously described, and is suitable for yachts of 40 to 60 feet in length.

It will pick out objects at $\frac{1}{2}$ to $\frac{3}{4}$ mile distant. It is fitted with a 9-inch Mangin Mirror, has our standard type of carbon-feeding mechanism, with both hand feed and automatic feed.

The amount of current can be from 5 to 10 amperes, and the candle power, 1,500 to 2,000. We will provide the proper rheostat to pass either 5, 7 or 10 amperes, if advised which current is wanted at time order is placed.

We are manufacturing the 9-inch Projector in either the plain or Form 1 Type shown above, the Form 3 Type shown on page 12, the Deck Type shown on page 13, and the Distant-Controlled Type shown on page 14.

All parts of the case and trimmings are well made and neatly finished. The case or cylinder is made of brass, highly polished, and the stand of iron or brass, as ordered.

The wires from the inside of the projector are brought down and out through the base, so as to bring them under the deck or within the pilot house, as the case may be.

This projector, while small in size, is in every way as reliable and satisfactory as our larger sizes.

The price includes rheostat for 125 volts or less, canvas cover and six pair carbons.

Price List—Form 1-M, 9-inch

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$180.00Mist	\$204.00Mock	14 $\frac{1}{4}$	36	K

For sizes of Carbons see page 51.
For dimensions see page 61.



FORM 3-M

9-inch Projector



With pilot house control. The handwheels are within the pilot house, and control the horizontal and vertical motion of the light.

Price List—Form 3-M, 9-inch

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$210 00.....	Mope	\$230 00.....	Moss	14 $\frac{1}{4}$	38	K

For sizes of Carbons see page 51.

For dimensions see page 61.

9-inch Deck Type Projector



Suitable for placing on the forward deck or bridge. Can be clamped in position. The stand and base are strong and substantial.

Price List—Form D-M, 9-inch

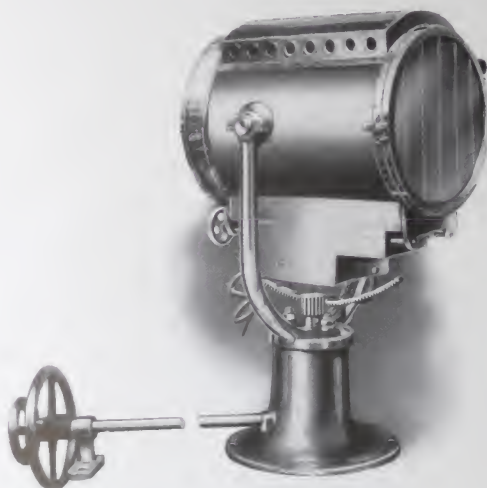
Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$200.00	Mull	\$228.00	Murk	44	52	K

For sizes of Carbons see page 51.
For dimensions see page 60.



9-inch Projector

DISTANT CONTROL TYPE



For placing on forward deck, and controlling from bridge or pilot house. The two handwheels enable the pilot to move the light in any direction. Control tubes may be made any length. Intermediate bearings are furnished to support the tube.

Price List—Distant Control Type

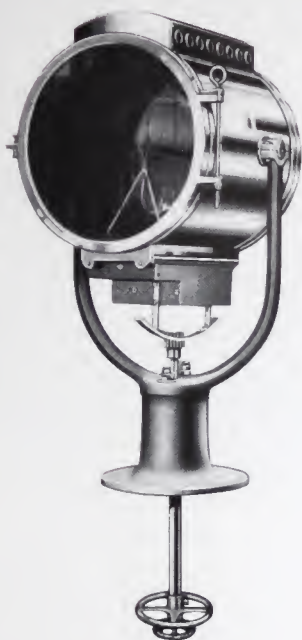
Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$240.00	Tag	\$270.00	Top	17 $\frac{3}{8}$	43	K

For sizes of Carbons see page 51.
For dimensions see page 62.

Price includes 10 feet of brass tubing.

Additional length of tubing furnished at \$1.00 per foot.

12-inch Projector



This projector is a popular size, and is intended to meet the demands of the medium-sized power launches and yachts, which require a compact, light and powerful projector.

It is 12 inches diameter, fitted with high-grade Mangin Mirror. The mechanism is our latest improved, horizontal type, both hand and automatic feed. Will burn in any position. It is furnished in our usual standard styles for hand control, pilot house control, deck control or distant control.

Price List will be found on the following page.



Price List—12-inch, Plain Hand Control FORM 1-M

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$285.00	Yerk	\$320.00	Yawl	20½	65	K

For dimensions see page 61.

Price List—12-inch, Pilot House Type FORM 3-M

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$320.00	Zeal	\$370.00	Zenith	20½	75	K

For dimensions see page 61.

Price List—12-inch on High Deck Stand DECK TYPE

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$300.00	Waft	\$350.00	Ward	40	95	K

For dimensions see page 60.

Price List—12-inch DISTANT CONTROL TYPE

Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Height to Center of Mirror in Inches	Weight Lbs.	Size of Carbons
\$350.00	Zax	\$380.00	Zest	20½	80	K

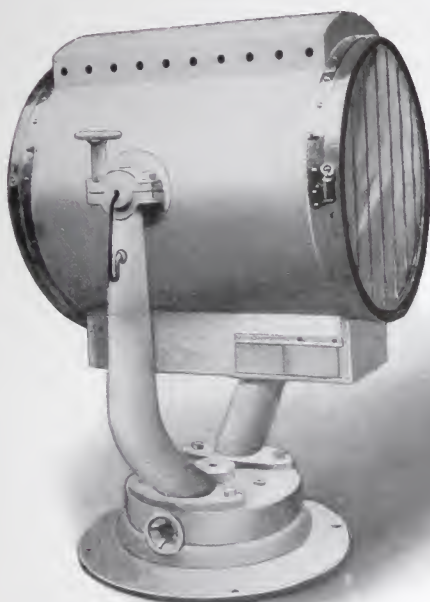
For dimensions see page 62.

For sizes of Carbons see page 51.

Price includes Canvas Cover, Rheostat for 125 Volts and Six Pair Carbons.

FORM 1-M

Plain Hand Controlled

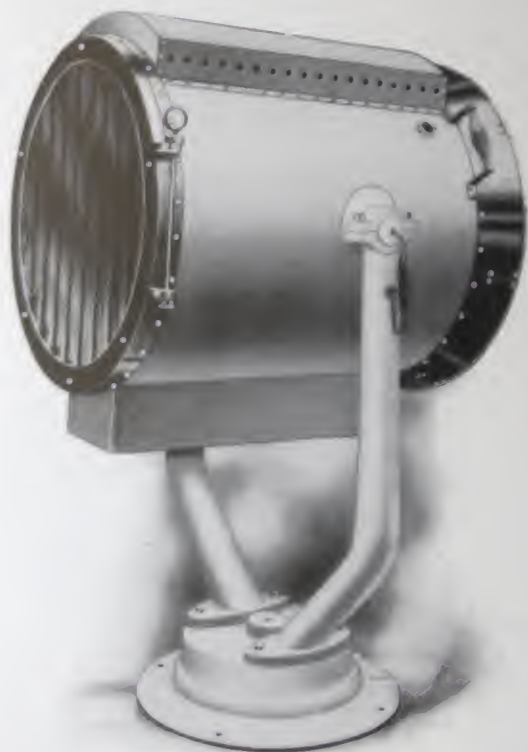


14-inch and 19-inch sizes

Price List on page 20.

FORM 1-M

Marine Projector

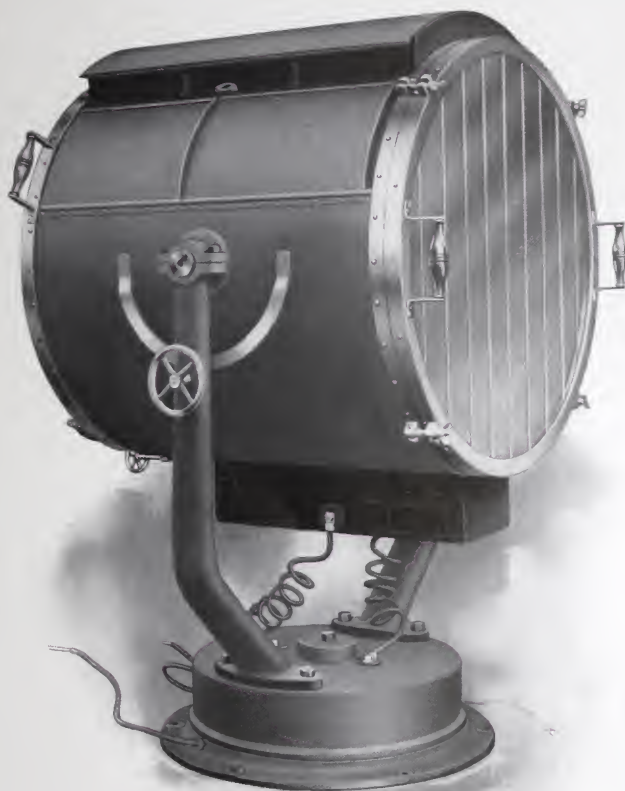


24-inch size

Price List on page 20.

FORM 1-M

Marine Projector



32-inch and 38-inch sizes

FORM 1-M

Plain Hand Controlled

The illustrations on the three preceding pages show our Marine Projectors, such as are to be used on the forward deck of a vessel, and directed by hand. Suitable handles are provided for directing the light, and also clamps for holding the cylinder in position when not in use.

They are fitted with good quality glass mirrors and our automatic carbon-feeding mechanism with hand-feed attachment.

Price includes rheostat for 125 volts or less, canvas cover and six pair carbons.

Price List—Form 1-M

Diameter of Cylinder Inches	Candle Power	Current in Amperes	Height to Center of Mirror	Weight Lbs.	PRICE						Size of Carbons
					White Enam- eled Iron	Code Word	Brass Cylinder Iron Stand	Code Word	Pol- ished Brass	Code Word	
14	5000	10-11	27	102	\$300	Act	\$320	Arch	\$360	Attest	L
14	5000	20-25	23	102	330	Aft	340	Argue	380	Attic	L
15	6000	31-40	26½	186	452	Age	474	Ark	550	Audit	O
24	14000	83-90	76½	366	472	Arm	494	Arm	570	Avail	O
37	34000	60	36	600	849	Alp	880	Arrow	964	Awake	P
38	35000	80	40	425	1300	Apw	1360	Ash	1690	Azure	R
45	45000	100	44	490	1960	Aswb	2040	Atom	2180	Axle	S
72	130000	135	60	700	2300	Acute	2450	Alder	2650	Aurw	Spec
18	30000	140	60	795	2800	Acdo	2975	Alien	3200	Anil	"
32	60000	160	60	875	3370	Agate	3570	Alloy	3800	Antler	"
32	40000	200	60	1000	4000	Agile	4300	Aloe	4800	Apex	"

For sizes of Carbons see page 51

For dimensions see page 50

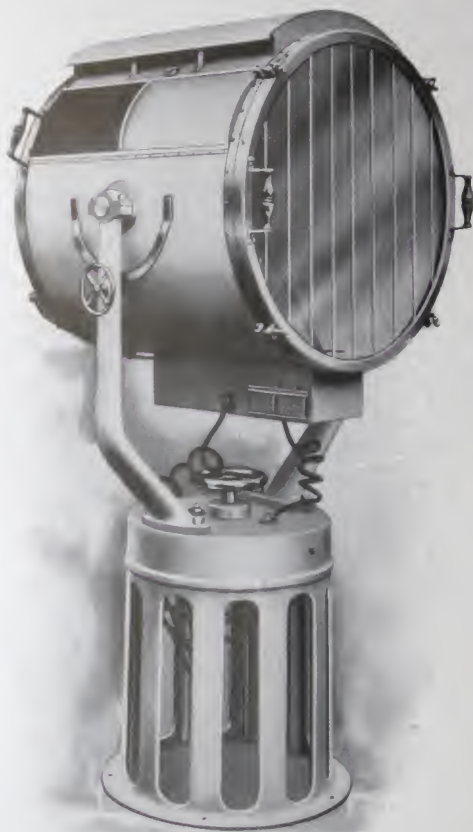
Deck Type Projector



14, 19 and 24-inch sizes

Price List on page 23.

Deck Type Projector



32 and 38-inch sizes

Price List on page 23.

TYPE DM

Deck Type Projector

The cuts on the two preceding pages show two of our Deck Projectors. This projector is mounted on a high stand, so as to bring the center of the mirror in line with a man's shoulders. Handles are provided for directing the cylinder, and clamps are provided for locking the projector in position when not in use.

The movable part of the projector is supported on a train of steel balls to reduce friction.

All parts are readily accessible, and the mechanism, insulated contacts, etc., are well protected from water.

They are fitted with good quality glass mirror and combined automatic and hand carbon-feeding mechanism.

Price includes rheostat for 125 volts or less, canvas cover and six pair of carbons.

Price List—Form DM

Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center Mirror Inches	Weight Lbs.	White Enamelled Iron	Code Word	Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Size of Carbons
14	3000	10-15	40	162	\$312	Babe	\$332	Beckon	\$402	Blast	L
14	5000	20-25	40	162	332	Badge	352	Beech	422	Blend	L
19	8000	35-40	45½	240	473	Bait	495	Behoof	595	Bliss	O
19	10000	45-50	45½	240	493	Balk	515	Bell	615	Blow	O
24	14000	60	51	340	870	Ban	900	Bevel	1010	Brusk	P
32	18000	80	56	450	1530	Base	1590	Bird	1720	Burse	R
38	24000	100	58	525	2000	Beak	2070	Bison	2220	Buxom	S

For Sizes of Carbons see page 51.

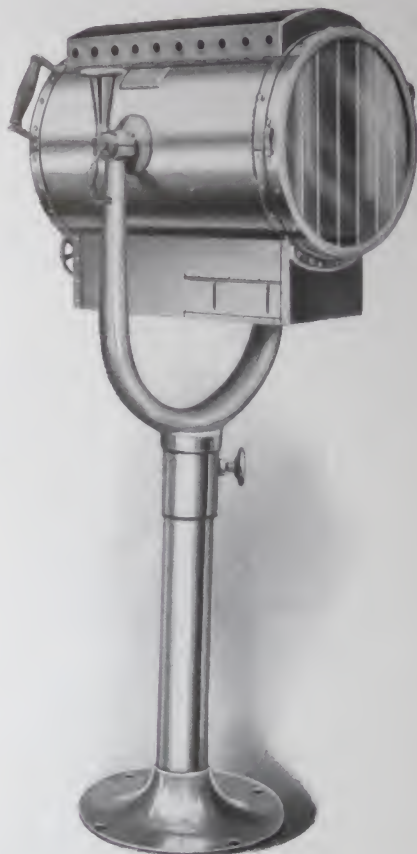
For dimensions see page 60.

For prices on larger sizes, see page 20.

Projectors larger than 38 inches diameter are made in Form 1-M only.



Special 14-inch Yacht Projector DECK TYPE



This is a very neat and attractive design, and has been brought out to fill the demand for a light yet strong Deck Projector. It is made in POLISHED BRASS ONLY; 15 to 20 amperes. Furnished with high-grade Mangin Mirror.

The mechanism, cylinder and all working parts, the same as our Standard Marine Projectors.

Price includes canvas cover, rheostat for 125 volts or less and six pair carbons.

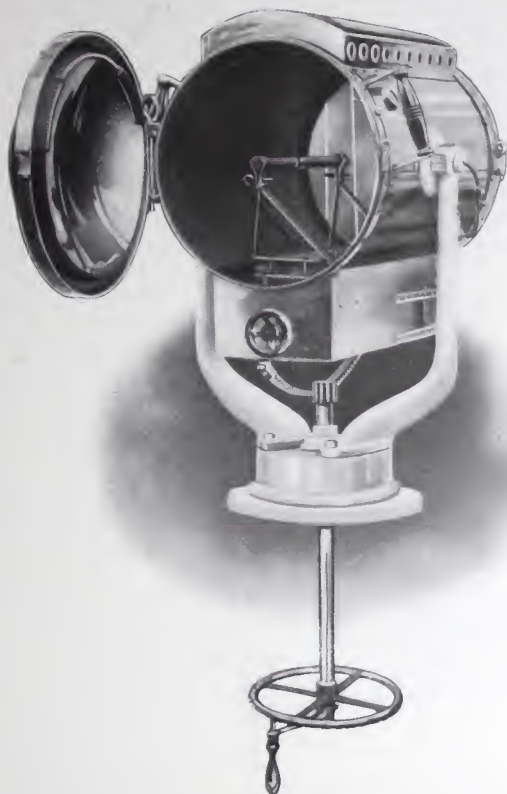
Price List 14-inch Deck Type

Price	Code Word	Height to Center of Mirror	Weight Lbs.	Size of Carbons
\$402.00	Blasting	40 inches	130	L

For sizes of Carbons see page 51.
For dimensions see page 60.

FORM 3-M

Pilot House Projector



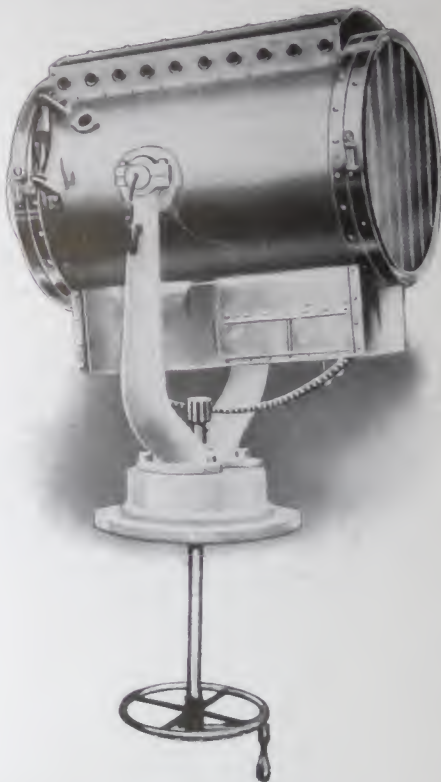
The above illustration and the one on the next page show our Pilot House Projector.

The controlling gear used with this projector is the most effective device of the kind yet invented. It consists of a hand-wheel and a lever and handle which are within the pilot house, and which connect with the projector by means of two vertical shafts, one within the other. The outer shaft is attached directly to the supporting yoke, and gives horizontal motion, while the inner shaft terminates in a small pinion. This pinion meshes with a segment of a gear attached to the case or cylinder of the projector, and thus the motion of the inner shaft elevates or depresses the light. A reference to the illustration will show the device clearly.

We can, at the option of the purchaser, furnish a lever control in which one lever in the pilot house controls both horizontal and vertical motions.

FORM 3-M

Pilot House Projector



The cases are all trimmed with polished brass end rings, and the spun cover of mirror is made of copper. The handwheels within the pilot house are made of brass, polished and lacquered.

Price includes rheostat for 125 volts or less, canvas cover and six pair carbons.

Price List—Form 3-M

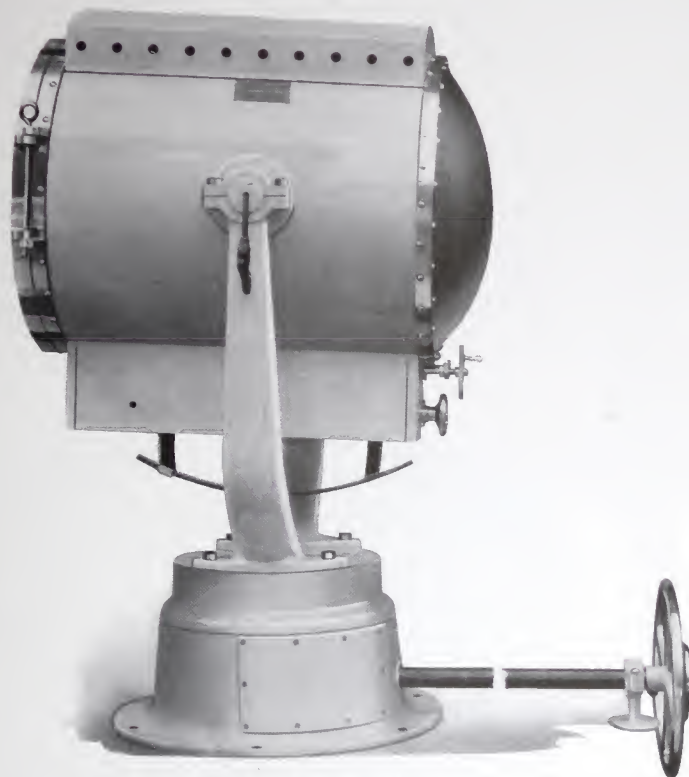
Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs	White Enamelled Iron	Code Word	Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Size of Carbons
14	3000	10-15	22	116	\$350	Cab	\$375	Chide	\$423	Cock	L
14	5000	20-25	22	116	370	Camp	395	Churn	443	Cog	L
19	8000	35-40	26 $\frac{1}{2}$	204	512	Cane	540	Civet	615	Coin	O
19	10000	45-50	26 $\frac{1}{2}$	204	532	Cart	560	Clang	635	Colt	O
24	14000	60	36	309	919	Cave	951	Cleat	1050	Conk	P
32	18000	80	40	395	1600	Chap	1660	Clod	1790	Crest	R
38	24000	100	44	490	2070	Chess	2140	Coax	2290	Cube	S

For sizes of Carbons see page 51.

For dimensions see page 59.

We can furnish the above projector with Form 2, distant cable control, and the same list prices will apply.

Distant Control Type



14, 19 and 24-inch sizes

It is frequently desirable to place the search light well forward, and in order to control its motion or direct it, we are making a distant control apparatus as shown in the illustration. This consists of a sub-base with bevel gears, so that the horizontal hollow shafts will move the search light in either a horizontal or vertical direction. The pilot has the handwheels within easy reach. The horizontal shafts or tubing can be made as long as necessary. Ordinarily 10 feet is furnished. Extra lengths at \$2.00 per foot additional.

Price List—Distant Control Type

Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs.	PRICE				Size of Carbons
					White Enam-eled Iron	Code Word	Brass Case Iron Stand	Polished Code Brass Word	
14	3000	10-15	25½	165	\$450. Decab		\$475. Dechide	\$548. Decock	L
14	5000	20-25	25½	165	470. Decamp		495. Dechurn	568. Decog	L
19	8000	35-40	32	290	675. Decane		705. Decivet	800. Decoin	O
19	10000	45-50	32	290	695. Decart		725. Declang	820. Decolt	O
24	14000	60	41¼	400	1100. Decave		1140. Declat	1250. Deconk	P

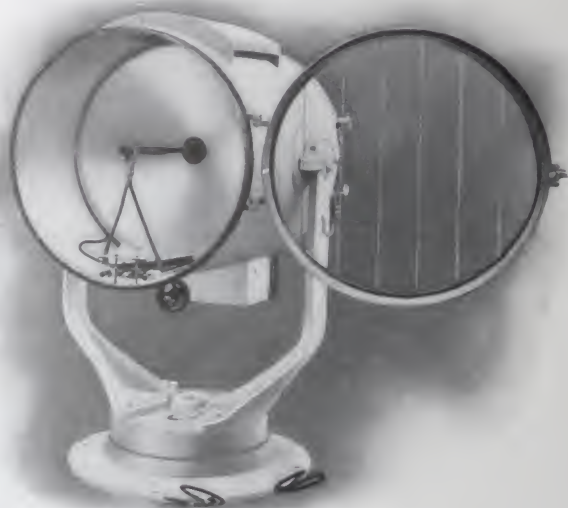
For size of Carbons see page 51.

For dimensions see page 62.

FORM C

**Search Lights with Silvered Copper
Reflectors**

Search light using reflectors in place of the more expensive mirrors are very generally used on steamers plying on inland rivers and lakes. They can not be classed as projectors, but, nevertheless, the search lights we are putting on the market possess such manifest advantages over other makes of reflector search lights that for many purposes they are as satisfactory as marine projectors.



For this class of search lights we have adopted the novel principle of horizontal carbons in front of a shallow parabolic reflector. By referring to the illustration it will be seen that the axis of the carbons coincides with the axis of the reflector, and the positive carbon facing the reflector, the crater in this carbon throws an intense cone of light on the latter, which in turn projects the light forward in a powerful beam of great intensity.

This arrangement gives the maximum amount of light with least amount of current. It also keeps the arc in the focus of the reflector, and at the same time renders it an easy matter to change the spread of the light by varying the relative distance between the arc and reflector. A handwheel is provided for this purpose, and a few turns one way or the other will change the light from a straight ray to a widely divergent ray, and vice versa.



These reflector search lights, or what we term Form "C" search lights, are in every way as well made as the marine projectors. The base, stand, case and mechanism are as substantially and carefully made, and the only difference is that they are fitted with silvered copper reflectors in place of the expensive glass mirrors.

Carbon-Feeding Mechanisms

The illustration below shows three of our standard carbon-feeding mechanisms. They operate on the same principle as our Marine Projector mechanisms, and differ only in mechanical details.



The same rheostats are furnished as with the Marine Projectors, and the standard equipment consists of rheostat, canvas cover and six pairs of carbons.

Dispersion Lenses

We furnish dispersion lenses for the Form "C" search lights, and the prices of these lenses will be found in a separate price list on page 40.

ELECTRIC SEARCHLIGHTS.

FORM 1-C

Plain Search Light



Silvered Coppered Reflector Type

The Plain or Hand-Controlled Search Light is provided with automatic mechanism, horizontal and vertical movements, and is to be directed by hand. It is entirely automatic and will burn in any position. It is provided with focusing screw and handwheel for changing the light from an intense straight ray to a spreading ray, for use in making landings, unloading vessels, etc.

Price includes rheostat for 125 volts or less, canvas cover and six pair carbons.

Price List—Form 1-C

Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs.	White Enamelled Iron	Code Word	Brass Case Iron Stand	Code Word	Polished Brass	Code Word	Size of Carbons
14	2000	10	21 $\frac{1}{2}$	90	\$170	Fadge	\$187	Faun	\$215	Flash	F
14	3000	15	21 $\frac{1}{2}$	90	170	Fag	187	Feat	215	Foam	F
19	4000	20	26 $\frac{1}{4}$	174	220	Fain	242	Fend	278	Font	G
19	6000	30	26 $\frac{1}{4}$	174	240	Fan	262	Fig	298	Fray	G
24	8000	40	36	238	300	Fash	327	Flail	375	Fume	H
24	10000	50	36	238	320	Fate	347	Flake	395	Fur	H

For sizes of Carbon see page 51.
For dimensions see page 59.



FORM 2-C

Steamboat Type Search Light



The illustrations on this and the two following pages show the type of steering gear used for directing the search lights from a distance. This type search light is mostly used on western rivers, where the search light is placed at the bow of the boat, and cables for moving same are run back to the pilot house.

Controlling Apparatus in Pilot House



The 14-inch Search Light, being comparatively light and simple, is provided with a bell crank movement, as shown on page 32. The 19-inch and 24-inch Search Lights, being heavier, are provided with a sheave wheel, gear and rack, as shown on the next page. The latter is a very powerful movement, and the search light may be raised and lowered with ease from a distant point.

The cables for the vertical and horizontal movements are independent of each other, and require no differential pulleys or other complicated mechanism for maintaining the relative positions of the two movements. Pulling one cable will not affect the other. The search light may be swung in a complete horizontal circle, and the vertical elevation is about 90 degrees.

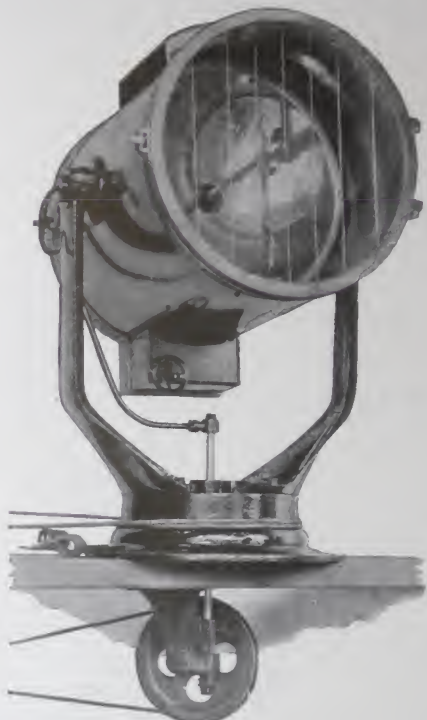
The complete equipment consists of the search light with elevating gear, pilot house gear (shown above), rheostat, six pairs carbons and canvas cover. Everything is furnished except the cables, which are to be provided by the purchaser.



ELECTRIC SEARCHLIGHTS.

FORM 2-C

Silvered Copper Reflector Type



In ordering, state whether the bracket carrying rocker arm or sheave wheel is to be attached to platform immediately below the search light, or if it is to be supported lower down. In either case, give the exact distance of top of bracket below the under side of lamp base, so we can cut the vertical thrust rod to proper length.

Price includes rheostat for 125 volts or less, canvas cover and six pair carbons.

Price List—Form 2-C

Diam- eter of Case Inches	Candle Power	Cur- rent in Am- peres	Height to Center of Mirror Inches	Weight Lbs.	White Enam- eled Iron	Code Word	Brass Case Iron Stand	Code Word	Pol- ished Brass	Code Word	Size of Car- bons
14	2000	10	21 $\frac{1}{2}$	104	\$210	Gab	\$231	Gift	\$265	Gnat	F
14	3000	15	21 $\frac{1}{2}$	104	210	Gain	231	Gild	265	Gore	F
19	4000	20	26 $\frac{1}{2}$	193	270	Gale	297	Glade	345	Grape	G
19	6000	30	26 $\frac{1}{4}$	193	290	Gash	317	Glass	365	Gulf	G
24	8000	40	36	258	350	Gawk	382	Gleam	434	Gum	H
24	10000	50	36	258	370	Gem	402	Globe	454	Gybe	H

For sizes of Carbons see page 51.

For dimensions see page 59.

FORM 3-C

Pilot House Search Light



Silvered Copper Reflector Type

ocker arm
tely below
In either
the under
to proper
cover and

Code Word	Size of Car- bons
Gnat	F
Gore	F
Grape	G
Gulf	G
Gum	H
Gybe	H

ee page 59.



FORM 3-C

Pilot House Search Light

Silvered Copper Reflector Type

The search light illustrated on the preceding page is the type mostly used when placed on top of the pilot house. It is placed directly over the pilot, and by means of two handwheels he is enabled to move the light horizontally or vertically.

The search light is provided with two vertical shafts, one within the other, and fitted with suitable handwheels. The inner shaft carries a small gear, which meshes into a segment of a gear attached to the body of the lamp. Turning the shaft elevates or depresses the light.

The outer shaft attaches directly to the upper base casting, and gives the search light horizontal motion.

Price includes rheostat for 125 volts or less, canvas cover and six pair of carbons.

Price List—Form 3-C

Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs.	White Enamelled Iron Code Word	Brass Case Iron Stand Code Word	Polished Brass Code Word	Size of Carbons
14	2000	10	21½	104	\$220 . . . Lace	\$242 . . . Lead	\$278 . . . Loan	F
14	3000	15	21½	104	220 . . . Lamb	242 . . . Leek	278 . . . Lock	F
19	4000	20	26¼	192	280 . . . Lance	308 . . . Lime	353 . . . Loom	G
19	6000	30	26¼	192	300 . . . Lapse	328 . . . Link	373 . . . Lull	G
24	8000	40	36	261	370 . . . Lark	402 . . . Lion	460 . . . Lyric	H
24	10000	50	36	261	390 . . . Lash	422 . . . Live	480 . . . Lug	H

For sizes of Carbons see page 51.

For dimensions see page 59.

Wide Angle Projectors with Dispersion Lenses

Dispersion lenses, as the name implies, are glass lenses to be used in search lights for dispersing or spreading out the light. These lenses are made of strips of heavy plate glass, one side of which is ground to a convex curve and highly polished. When the light passes through these strips it is first converged or brought together and then, as the rays cross, they spread out again and continue to spread indefinitely. The effect when



Photograph of Light Spread Out by the Lenses

placed in front of a search light is to spread the light out in the shape of a partly opened fan. The light is spread out flat or horizontally, but not vertically. It thus lights up all objects on the water, or on the bank, much better than the ordinary straight beam. The light when thus spread out will not penetrate as far.

It is for this reason that dispersion lenses in the past were always mounted on a separate ring or door, so that when the pilot wanted to pick out distant objects, he could have the lenses removed, and when it was desired to light up a tow of barges or

ELECTRIC SEARCHLIGHTS.

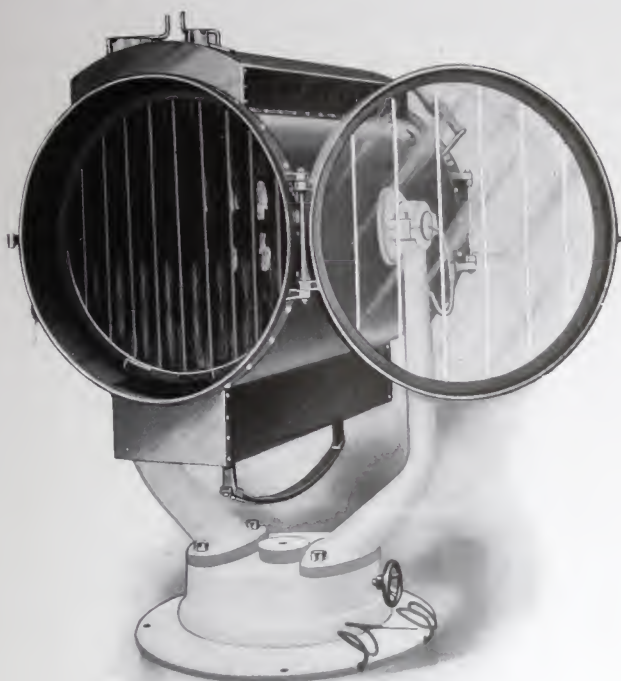


This illustration shows the Light when the Dispersion Lenses have been removed



make a landing, the lenses were replaced. This has always been a troublesome operation, and after being used a few times, the usual practice has been to put the dispersion lens door carefully away, and never use it again, notwithstanding the great utility and convenience resulting from its use.

We have given this subject a great deal of consideration, and have made numerous experiments with a view to devising a more



satisfactory method. Finally we arranged the lenses in two semi-circular brass rings, so pivoted that they could be swung around a vertical axis. These are clearly shown in the illustration on page 38, which shows one of our search lights with the door swung open. The lenses are here shown set, so as not to interfere with the light. The light now emerges in a solid straight beam with practically no spread. When the lenses are set, as shown in the illustration above, they intercept all the light, and as it emerges from the search light it spreads out in a wide, flat beam.

On the top of the search light cylinder are two brass handles, by means of which the lenses may be swung into position or out of position. This requires but a moment's time, and the front door does not need to be opened.

The convenience is so great that the light may be spread out or narrowed down as often and as quickly as desired. Every part is self-contained in the search light itself.



ELECTRIC SEARCHLIGHTS.

This device is covered by broad patents.

We furnish these lenses mounted in swinging doors for all sizes except the 9-inch. On the 9-inch light the lenses are in a separate removable ring. They work as well with silvered copper reflector lights as they do with Marine Projectors.

The prices below are for dispersion lenses only, fitted in the search light. These prices must be added to the price of the search light.

These lenses can be fitted to any type of search light, the Marine Projectors as well as the silvered copper reflector search lights.

Price List of Dispersion Lenses

		Code Word
For 9-inch search lights in separate ring	\$40.00	Dab
For 12-inch search lights in swinging doors	54.00	Dome
For 14-inch search lights in swinging doors	60.00	Dew
For 19-inch search lights in swinging doors	80.00	Disk
For 24-inch search lights in swinging doors	104.00	Doe
For 32-inch search lights in swinging doors	146.00	Dupe
For 38-inch search lights in swinging doors	170.00	Dusk

If the lenses are preferred mounted in a separate ring, to slip over the front of the search light, we can supply them at the same price as above.

A-C Search Lights

For 60 Cycle Alternating Current of 110 Volts

Patent Applied for

After much experimenting we have placed on the market a search light to operate on alternating current that is in every way a success and a perfect commercial article. The fact that we are the original makers in the United States of the present type of direct-current projectors, puts us in an advantageous posi-



tion, on account of our years of experience and success in the direct-current field, to bring out this alternating-current apparatus, and to offer it to the trade as the highest development possible at the present time.

We realized long ago the need of a good alternating-current search light, but we also realized the difficulties to be overcome in designing and arranging the parts. We thoroughly understand the principles of the projection of light, and have con-



ducted a long series of experiments to find the best angle at which to place the carbons to obtain the maximum light from the reflector.

In a direct-current arc there is a highly luminous crater in the positive carbon, where practically all the light is concentrated, and it is this crater that is made use of to project the intense light on the reflector. An alternating-current arc has no well-defined crater on either carbon; in fact, the light is obtained from both carbons and the arc itself, so obviously some different method must be employed to centralize the light and bring it to the focus of the reflector.

We finally adopted the principle of placing the carbons at an angle of 90 degrees to each other, and each carbon at 45 degrees to the axis of the reflector. By this method we have all the light of both craters and of the flame itself cast on the reflector from the smallest possible focus, so that the resulting ray is almost as brilliant and almost as concentrated as in our direct-current apparatus.

The arrangement of the carbons is seen in the illustration on page 43, where the mirror is shown swung back, and the carbon-feeding mechanism exposed. In this position both carbons are brilliantly illuminated at the ends, and a highly luminous arc exists between them. This arc is of an appreciable size, and the effect is to produce a beam of light from the reflector of more spread and less concentration than is produced by the direct-current arc. Consequently the range of the alternating-current search light is not quite as great as the direct-current search light.

Nevertheless it is a very effective beam, and will easily render visible light-colored objects at three-fourths of a mile distant, or more. This range is based on the 19-inch silvered copper reflector search light. The same size, with the Mangin Mirror in place of the reflector, has a range of one mile or more.

The carbon-feeding mechanism is entirely automatic, and starts the arc and feeds the carbons together as they are consumed. It will burn in any position, and is not affected by temperature, vibration or jars. It is strictly positive and will work equally well under the worst conditions. The general construction is the same as our direct-current search lights. The cylinder is of the same substantial construction, and the stand, base and trunnions are heavy and durable.

ELECTRIC SEARCHLIGHTS.



We have found that the least current consumption should be 20 amperes, as anything less than this will not give a satisfactory light. The operation of alternating-current search lights is accompanied by a slight humming noise, which has been reduced to the smallest amount possible. It is not in any way objectionable, as the search lights will be used for lighting large outdoor spaces, where the noise will not be noticed.

Resistance is furnished for 110 volts, 60-cycle current, and a canvas cover and six pair of carbons are included with each search light. At present we are making this type in 19-inch and 24-inch sizes. We furnish them in the same various types as our direct-current lamps, viz.: Form 1, or Plain Lamp, Form 3, or Pilot House Lamp, and Form D, or Deck Type.

Following will be found price list, applying to these various types.

For dimensions, see pages 59 and 60.



ELECTRIC SEARCHLIGHTS.

Price List — A-C Search Lights — Lens Mirror Type

Form	Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs.	White Enameled Iron	Code Word	Brass Case Iron Stand	Code Word	Polished Brass	Code Word
Form 1 M	19	5000	25	26 1/2	186	\$555	Aimed	\$576	Armlet	\$666	Availed
Deck Type, D M	19	5000	25	45 1/2	240	576	Galked	604	Beller	720	Blower
Form 3 M	19	5000	25	26 1/2	204	622	Carter	655	Clanged	744	Colter
Form 1 M	24	10000	50	36	290	1020	Antler	1052	Arranter	1150	Awarded
Deck Type, D M	24	10000	50	51	340	1042	Barber	1076	Bircher	1204	Budget
Form 3 M	24	10000	50	36	310	1098	Caver	1132	Cleater	1250	Conker

Price List — A-C Search Lights — Silvered Coppered Reflector Type

Form	Diameter of Case Inches	Candle Power	Current in Amperes	Height to Center of Mirror Inches	Weight Lbs.	White Enameled Iron	Code Word	Brass Case Iron Stand	Code Word	Polished Brass	Code Word
Form 1 C	19	5000	25	26 1/4	174	\$280	Fanner	\$306	Figlet	\$338	Frayer
Form 2 C	19	5000	25	26 1/4	193	340	Gasher	372	Glasser	424	Gulfer
Form 3 C	19	5000	25	26 1/4	192	352	Lapser	386	Linker	438	Lulled
Form 1 C	24	10000	50	36	238	376	Faded	410	Flaked	462	Furred
Form 2 C	24	10000	50	36	258	434	Gemlet	472	Glober	532	Gyber
Form 3 C	24	10000	50	36	261	454	Lashed	494	Livelet	564	Lugger

Special Applications



Of late years search lights and projectors have been very generally used in a great variety of ways other than on shipboard. The above illustration shows one of the most common uses. In this particular instance a search light with dispersion lenses is used to illuminate an excavation, so that a night shift can work. It will be noted how clearly every part of the work is lighted, and how soft and free it is from blinding glare. This is due to the use of the dispersion lens, which spreads the light out uniformly, and does away entirely with the strong central beam.

For night work a search light has nothing that can compare with it. It can be placed far enough away so that blasting will not affect it. For work in stone quarries, cement works, on ore heaps, coal piles, and in fact where a strong, well-diffused light is needed, a search light will be found better than any other form of illumination.

ELECTRIC SEARCHLIGHTS.

We have frequently furnished search lights with double dispersion lenses for illuminating large advertising signs. The effect is marvelous. The clear white light is thrown on the sign in a clean-cut square (due to the double lenses) and lights it uniformly.

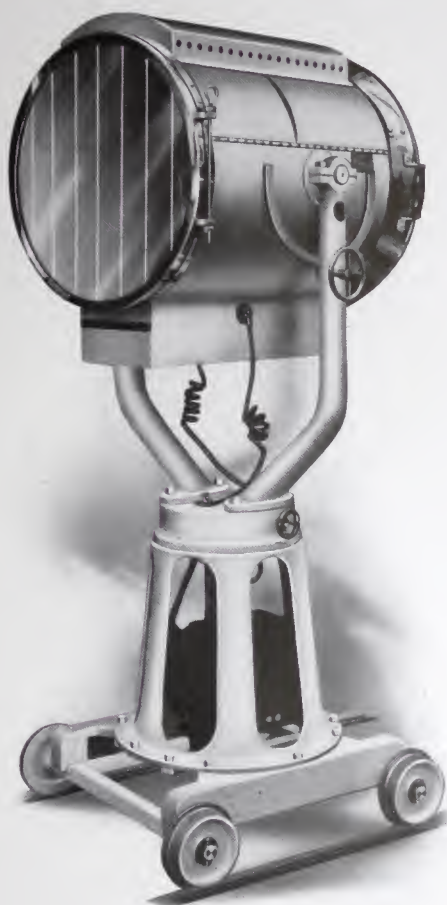


Search Light with Double Dispersion Lenses

We can supply search lights for this purpose in a great variety of sizes, and will take pleasure in making quotations on apparatus to suit any requirements.

We have mentioned but a few of the many uses to which search lights can be put, and we solicit inquiries from anyone who has trouble with unsatisfactory illumination. Write us, and the chances are we can improve your present method many times over.

Projectors on Trucks

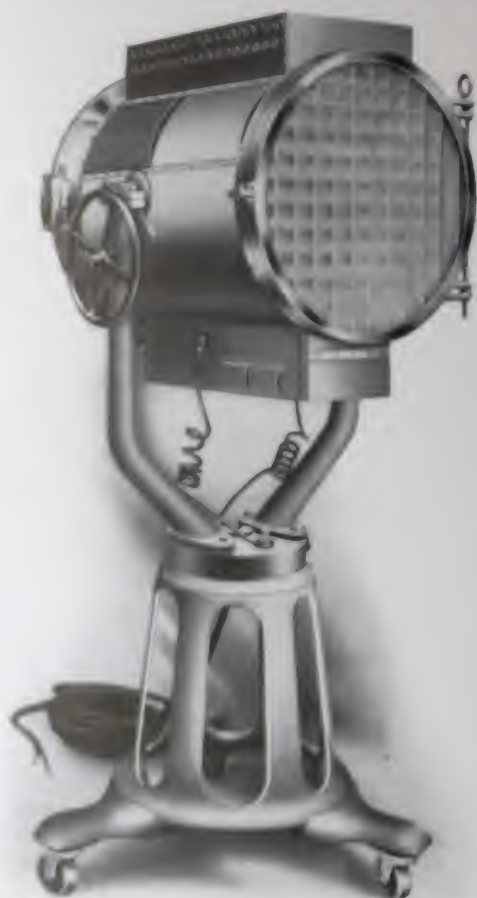


Projectors are frequently required to be of the portable type, for moving around from place to place. We can supply suitable trucks with large diameter casters, or can mount the projector on a truck with flanged wheels, for running on a track, as shown above.

This form of projector is of particular use where the apparatus has to be run under cover during gun fire, or in quarries or mines, where it is taken to different locations. We can make the gauge or style of truck to suit any conditions.

Prices on application.

Photographic Projectors



For use in photography the search light projector has been found indispensable, in fact it is the only satisfactory and economical means of making THREE-COLOR PROCESS PLATES. By its use a daylight gallery can be entirely done away with. It gives a light as good as sunlight, and of uniform intensity.

We are putting on the market a projector of the highest class, made in 24-inch size, with special 24-inch short focus parabolic mirror, and with double dispersion lenses, made of clear optical glass.

ELECTRIC SEARCHLIGHTS.

In numerous experiments it was found that the optical glass was absolutely necessary to obtain good results, and we import a fine grade of glass, which is made up for the purpose, and the dispersion lenses are ground from it.

The light is of uniform brilliancy, and at a distance of 20 feet will light up a 10-foot square. The light is admirably adapted to making photographic plates, for three-color process work, through colored filters. We have supplied these projectors to many of the large engraving companies, who are using them with great success.

The equipment consists of the 24-inch projector on pedestal with casters, for moving around, with mirror and double lenses, the automatic arc lamp, resistance for 110 volts direct current and flexible cable connection.

It has tilting motion and horizontal swiveling motion, and can be locked in any position.

The arc consumes 60 amperes of current. The construction is of the best. The pedestal and stand are cast iron; the cylinder or case of heavy sheet iron, and the doors and trimmings of heavy brass and copper.

Height, floor to center of case, 62 inches.

Length of Cylinder, 30 inches.

Weight, 400 pounds.

Price, \$1,400.

Navy Standard Search Light



The United States Navy Department requires search lights to meet certain specifications, and we have developed a type of search light projector which is approved by the Navy Department. These search lights have all the accessories required, and the various details and fittings are made to specifications.

The carbon-feeding mechanism is of the motor-feed type, and maintains a uniform voltage across the arc. It also is arranged for hand feed. The positive carbon has external hand adjustment.

As each search light is usually built to conform to certain special specifications, it is impossible to publish any established price list. Prices will be quoted on application.



Sizes of Search Light Carbons

Silvered Copper Reflector Search Lights

Amperes	Positive Carbon	Negative Carbon	Symbol
10 and 15	$\frac{5}{8} \times 7\frac{1}{2}$ cored	$\frac{3}{8} \times 7\frac{1}{2}$ solid	F
20 and 30	$\frac{3}{4} \times 7\frac{1}{2}$ cored	$\frac{9}{16} \times 7\frac{1}{2}$ solid	G
40 and 50	1 x 7 $\frac{1}{2}$ cored	$\frac{5}{8} \times 7\frac{1}{2}$ cored	H

Marine Projectors

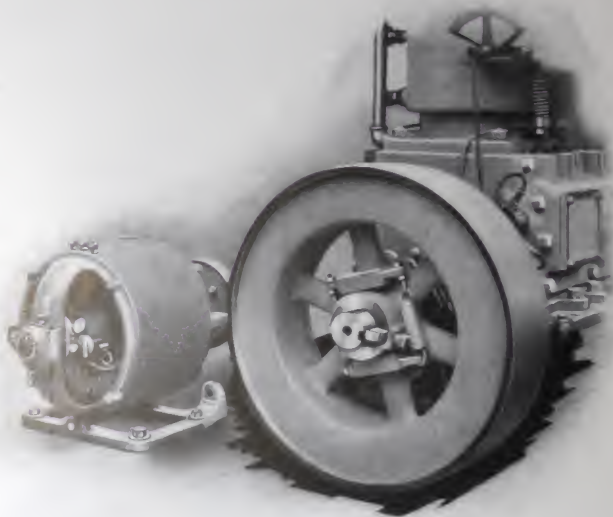
Amperes	Positive Carbon	Negative Carbon	Symbol
3 to 5	$\frac{3}{8} \times 4$ cored	$\frac{1}{8} \times 3$ solid	J
5 to 10	$\frac{1}{2} \times 5$ cored	$\frac{1}{2} \times 3\frac{1}{2}$ solid	K
10 to 25	$\frac{5}{8} \times 7\frac{1}{2}$ cored	$\frac{5}{8} \times 5$ solid	L
30	$\frac{3}{4} \times 7\frac{1}{2}$ cored	$\frac{9}{16} \times 7\frac{1}{2}$ solid	M
35 to 40	1 x 7 $\frac{1}{2}$ cored	$\frac{5}{8} \times 7\frac{1}{2}$ cored	O
45 to 50	1 x 7 $\frac{1}{2}$ cored	$\frac{5}{8} \times 7\frac{1}{2}$ cored	O
60	1 x 8 $\frac{1}{4}$ cored	$\frac{5}{8} \times 8\frac{1}{4}$ cored	P
80	1 $\frac{1}{8} \times 9$ cored	$\frac{3}{4} \times 9$ cored	R
100	1 $\frac{1}{4} \times 10$ cored	$\frac{7}{8} \times 10$ cored	S

Carbons for A-C Search Lights

These are special. Do not order any of above.



Launch Dynamo



We are manufacturing a special dynamo for friction drive. In a boat a belt-driven dynamo is a nuisance. The belt is continually getting loose, coming off, and has to be put away when the dynamo is not in use. We have overcome all these difficulties by bringing out our friction-driven dynamo. This dynamo, as will be seen by referring to the illustration, is pivoted and the friction pulley is pressed against the engine flywheel by a heavy spring.

When the dynamo is not in use the spring is compressed by the handwheel. The dynamo is rocked away from the engine, and the friction pulley is drawn away from the flywheel. If it is desired to use the dynamo, a few turns of the handwheel releases the spring. The friction pulley is brought in contact with the flywheel, and the dynamo is set in motion.

The dynamo is made of steel, with laminated, toothed armature, carbon brushes, and self-oiling bearings. The output is 70 volts and 8 to 10 amperes. It is intended to light the 7-inch or 9-inch search light.

Price List—Launch Dynamo

Length Inches	Width Inches	Height Inches	Weight lbs.	List Price	Code Word
17½	10¾	12¾	100	\$120.00	Pax

Price includes Field Rheostat and Pulley.



Electric Light Plants

For Launches and Yachts

For launches and yachts of 40 feet in length or over, we strongly recommend the use of one of our Direct-Connected Generating Sets. These Generating Sets consist of a gasoline engine and multi-polar dynamo mounted on a light cast-iron bed plate. All bearings are accurately planed and fitted and are in perfect alignment. The engine shaft is an open-hearth steel forging with balance weights forged solid on the crank arms. Bearings are large and ample and will not heat up nor cut.

In the flywheel is contained the governor which operates direct on a throttle valve. It maintains the speed within 2 per cent variation from no load to full load.

On one side of the engine is the circulating pump for pumping the cooling water through the water jacket.

A gasoline carburettor is fitted to the engine. Gasoline may be drawn from the main supply tank. Ignition is by jump spark. Batteries and spark coil are furnished. A multiple tank lubricator with oil leads to cylinders and bearings insures ample lubrication.

Owing to the heavy flywheel and the speed at which the engine is run, the lights are absolutely steady and there is none of the disagreeable flickering usually associated with a gasoline-engine-driven dynamo.

We are manufacturing these Generating Sets in five sizes, as follows:

No. 0	42 volts	15 amperes
	or 70 volts	9 amperes
No. 1	65 volts	22 amperes
	or 110 volts	13 amperes
No. 2	110 volts	28 amperes
No. 3	110 volts	55 amperes
No. 4	110 volts	125 amperes

No. 0 Generating Set



This is designed to charge sixteen cells of storage battery of suitable capacity.

Gasoline tank is in base of engine.

The engine is of the horizontal 4-cycle type, with a very good hit-and-miss governor. We do not recommend the use of this outfit for lighting incandescent lamps unless a storage battery is used in connection with it to steady the lights. The engine is 4-inch bore by 4-inch stroke and develops $11\frac{1}{2}$ horsepower. The dynamo is of the latest 4-pole construction, having laminated pole pieces and is very efficient. We wind the dynamo for 42 volts and 15 amperes for storage battery charging or for 70 volts and 9 amperes for operating a search light. In connection with one of our 9-inch or 14-inch search lights this makes an ideal portable set for special illumination of outdoor construction work and for advertising.

Speed, 600 R. P. M.

Dimensions of Bed Plate, 40 inches by 29 inches.

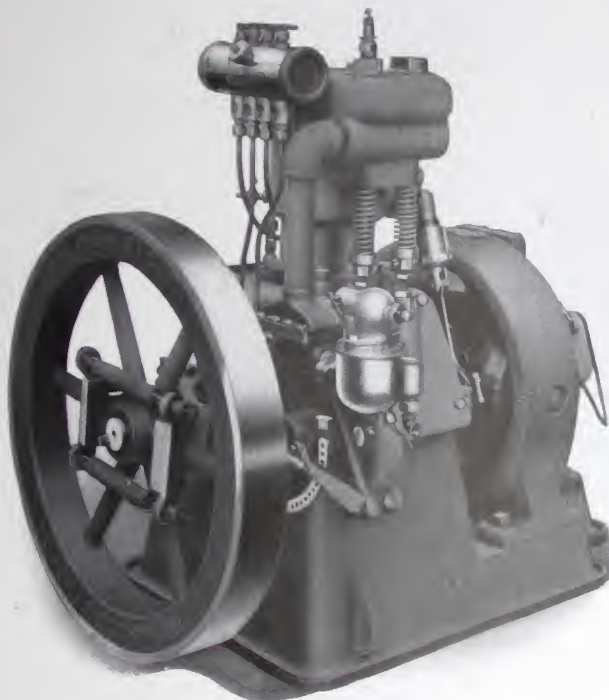
Height over Flywheel, 19 inches.

Weight, 435 pounds.

List price of Direct-Connected Engine and Dynamo as shown, \$160.

Code Word, RUFF.

No. 1 Generating Set



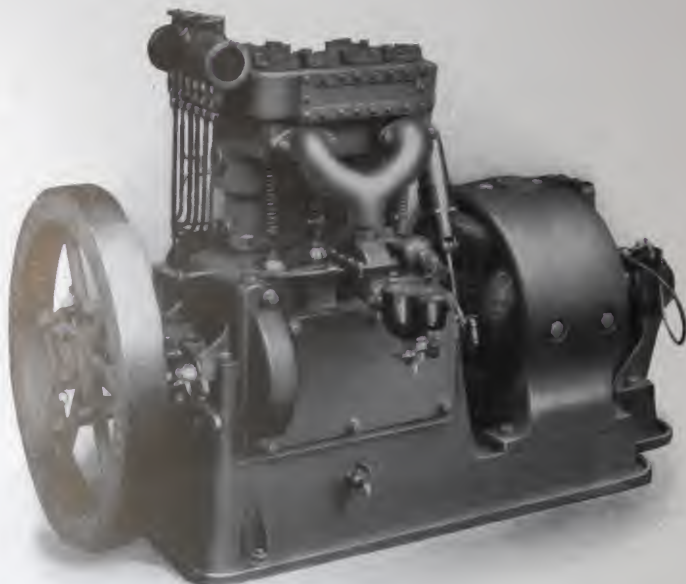
This Generating Set can be used to charge storage batteries or for running lights direct. It is provided with a special sensitive governor that will take care of the voltage from no load to full load with no perceptible variation. The lamps are steady, as the engine is provided with a heavy flywheel. This dynamo is wound for 60 volts when required to light lamps direct. At 110 volts the output is 13 amperes. This will carry 25 carbon lamps of 16 candlepower each or 50 Tungsten lamps of 16 candlepower each. The engine is of the 4-cycle type, single cylinder, 4-inch bore by 5-inch stroke, developing about 3 horsepower.

List Price, \$445.

DIMENSIONS — Length, 34 inches; width, 20 inches; height, 30 inches; speed, 750 R. P. M.; weight, 585 pounds.

Code Word, RASP.

No. 2 Generating Set



This is a Double-Cylinder Four-Cycle Engine, and is provided with a sensitive governor same as the No. 1 plant. The cylinders are 4-inch bore by 5-inch stroke, and the engine develops about 6 horsepower. The lights are absolutely steady and there is no flicker either on light load or full load.

Ignition is by jump spark. Batteries and spark coil are furnished. A multiple-tank lubricator, with oil leads to cylinders and bearings, insures ample lubrication.

This dynamo is wound for 110 volts for running lights direct.

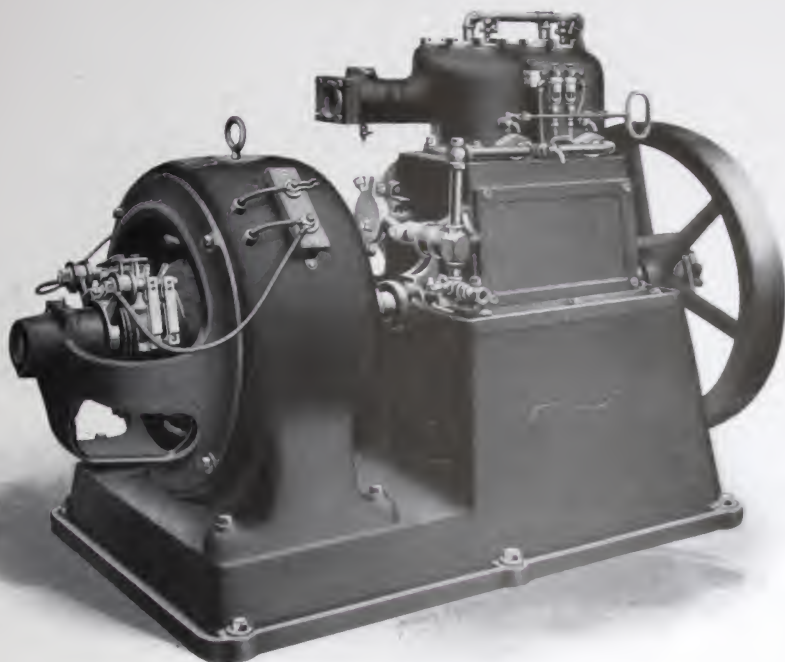
The capacity at full load is 50 carbon lamps of 16 candlepower each or twice the number of Tungsten lamps.

List Price, \$650.

DIMENSIONS — Length, 42 inches; width, 20 inches; height, 30 inches; speed, 750 R. P. M.; weight, 900 pounds.

Code Word, SCARE.

No. 3 Generating Set



This Generating Set is built on the same general lines as our No. 2 set. The engine is double cylinder of the 4-cycle type, 5-inch bore by 6-inch stroke. The cooling water is circulated by the pump shown on the side of engine, a gasoline carburettor is fitted and the most improved force-feed oiling system is supplied. The governor is of the throttling type and is very sensitive, so that wide variations in load cause but slight change in the voltage of the dynamo.

This engine and dynamo is designed for lighting of large yachts and auxiliary cruisers and for furnishing power for motors for operating windlass, etc. Also makes a good plant for large stores.

Output of No. 3 Generating Set: 6 kilowatts. 110 volts 55 amp.

Speed, 600 R. P. M.

Width, 29½ inches.

Length, 62 inches.

Height, 42 inches.

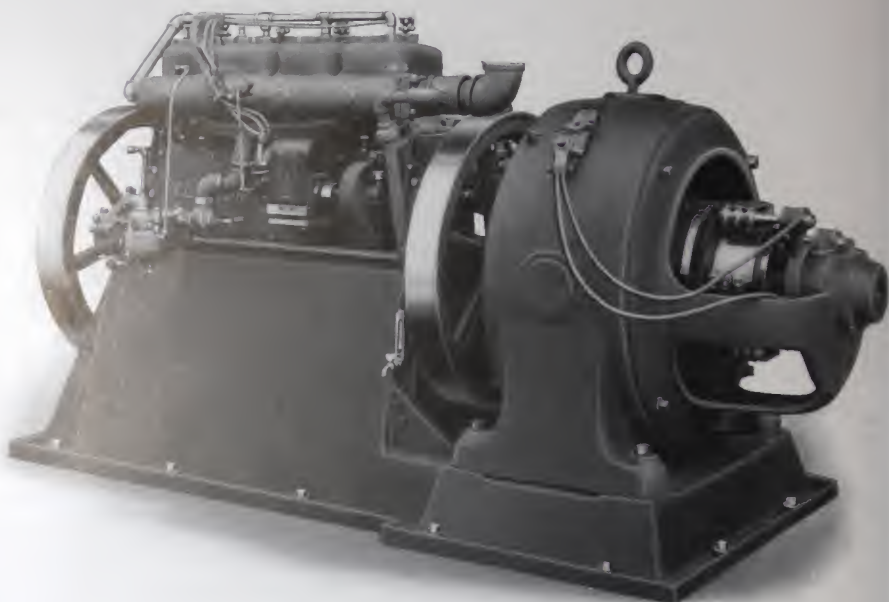
Weight, 2,500 pounds.

List price, \$1,100.

Code Word, RACE.



No. 4 Generating Set



This plant is a very substantial plant, with a capacity of $12\frac{1}{2}$ K. W., large enough to furnish light for a small size municipal lighting plant. It will carry 500 25-watt Tungsten incandescent lamps.

The engine is a 4-cylinder, 4-cycle engine, 5-inch bore by 6-inch stroke, with close regulating throttling governor. Has circulating pump, force-feed oiling system and gasoline pump.

The dynamo is a multipolar, compound wound dynamo, and is capable of carrying full load indefinitely.

This is a very fine running plant, regulating closely, and with no flicker to the light.

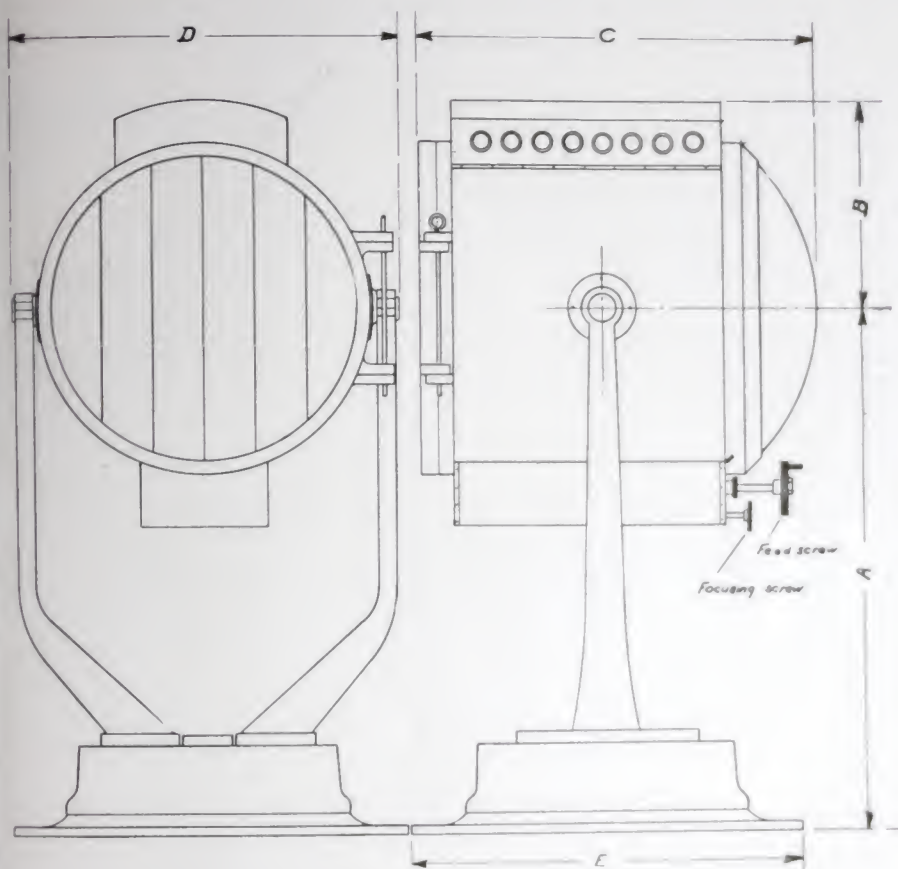
The output is $12\frac{1}{2}$ K. W., 125 amperes, 110 volts.

List price, \$1900.

DIMENSIONS — Length, 90 inches; width, 39 inches; height, 46 inches; speed, 500 R. P. M.; weight, 4,500 pounds.

Code Word, SCRIBE.

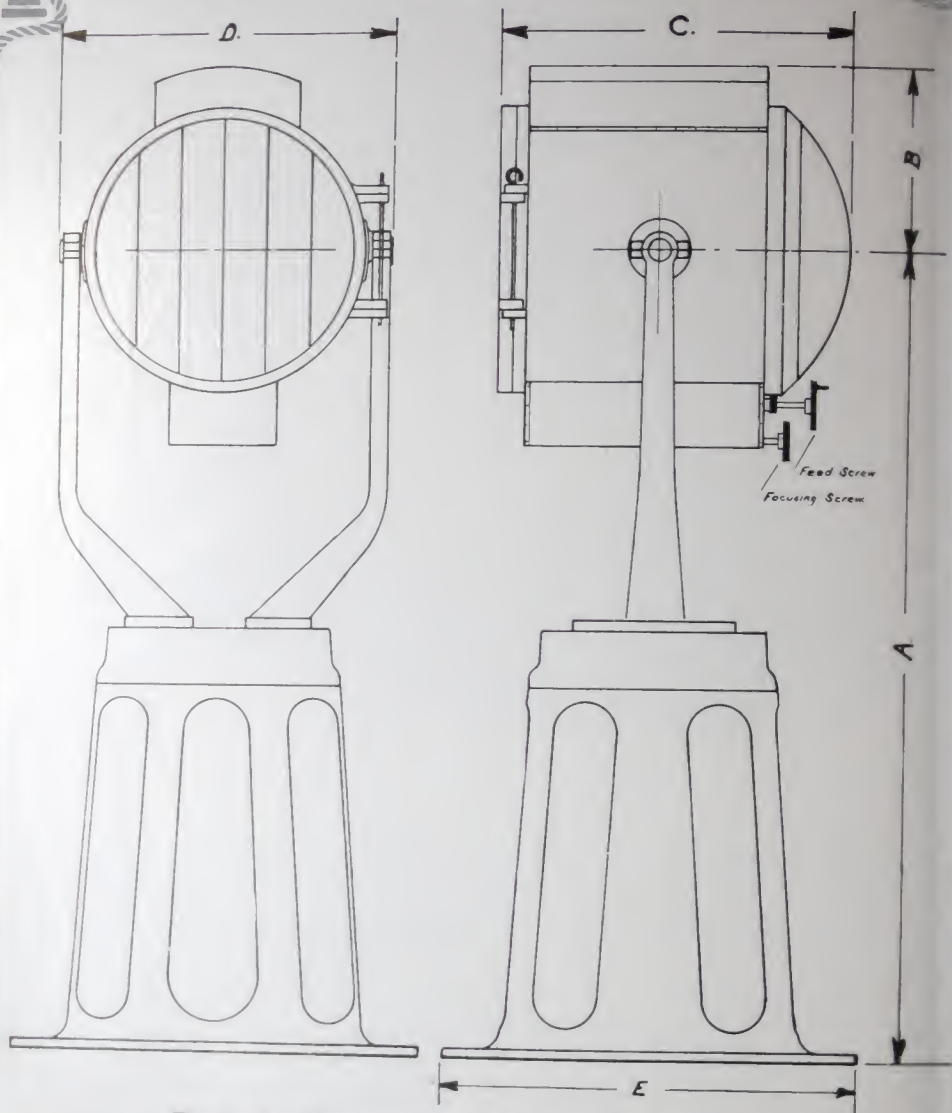
ELECTRIC SEARCHLIGHTS.



Dimensions of Form 1, 2 and 3 Projectors in Inches

Diameter of Case Inches	A	B	Lens Mirror Lamps		Silvered Copper Reflector		D	E
			With Dispersion Lens C	Without Dispersion Lens C	With Dispersion Lens C	Without Dispersion Lens C		
14	21 $\frac{1}{2}$	8 $\frac{1}{2}$	26 $\frac{7}{8}$	23 $\frac{5}{8}$	27 $\frac{1}{2}$	23	17 $\frac{1}{2}$	13
19	26 $\frac{1}{4}$	11 $\frac{1}{4}$	30 $\frac{3}{4}$	27	28 $\frac{1}{4}$	24 $\frac{5}{8}$	24	20
24	35 $\frac{1}{2}$	15 $\frac{1}{4}$	38 $\frac{1}{2}$	34 $\frac{1}{2}$	33	28 $\frac{1}{2}$	29 $\frac{1}{2}$	20
32	37	22		38 $\frac{3}{4}$			41	26
38	48	26		41			47	26

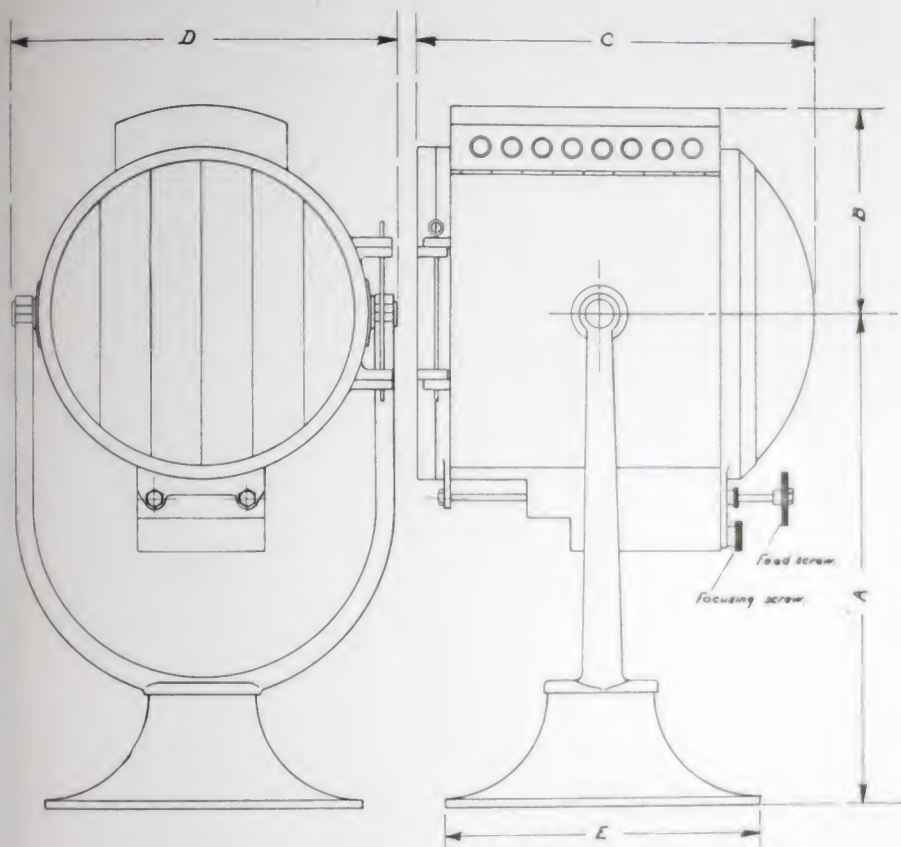
ELECTRIC SEARCHLIGHTS.



Projector Dimensions, Deck Type, in Inches

Diameter of Case Inches	A	B	Lens Mirror Lamps		Silvered Copper Reflector		D	E
			With Dispersion Lens C	Without Dispersion Lens C	With Dispersion Lens C	Without Dispersion Lens C		
7	44	4 $\frac{1}{2}$		11 $\frac{1}{2}$			9	
9	44	5 $\frac{5}{8}$		14 $\frac{1}{2}$			10 $\frac{3}{4}$	
12	44	7 $\frac{1}{4}$		15 $\frac{1}{4}$			15 $\frac{3}{4}$	9
14	40	8 $\frac{1}{2}$		23 $\frac{1}{8}$			17 $\frac{1}{2}$	14
19	45 $\frac{1}{2}$	11 $\frac{1}{2}$	26 $\frac{7}{8}$	27	27 $\frac{1}{2}$	23	24	16 $\frac{1}{2}$
24	51	15 $\frac{1}{8}$	30 $\frac{5}{8}$	34 $\frac{1}{2}$	28 $\frac{3}{4}$	24 $\frac{1}{8}$	24	22 $\frac{1}{2}$
32	56	22	38 $\frac{1}{2}$	38 $\frac{3}{4}$	33	28 $\frac{1}{4}$	29 $\frac{3}{8}$	22 $\frac{1}{2}$
38	58	26		41			41	
							47	

ELECTRIC SEARCHLIGHTS.

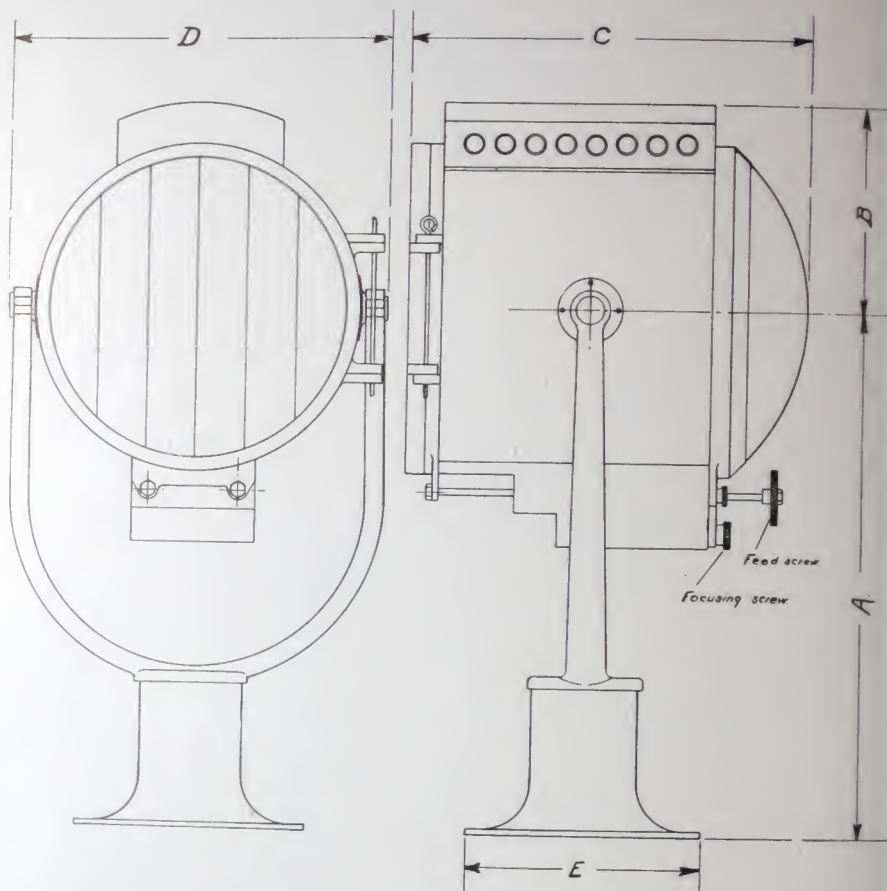


Dimensions of Forms 1-M and 3-M Projectors in Inches

Diameter of Case in Inches	A	B	C	D	E
7	10	4 ¹ / ₂	11 ¹ / ₂	9	6
9	14	5 ³ / ₈	14 ¹ / ₄	10 ³ / ₄	9
12	20	7 ¹ / ₄	15 ¹ / ₄	15 ¹ / ₄	9



ELECTRIC SEARCHLIGHTS.



Dimensions of Distant Control Projectors in Inches

Diameter of Case in Inches	A	B	C	D	E
9	14	5 $\frac{3}{8}$	14 $\frac{1}{2}$	10 $\frac{3}{4}$	9
12	20	7 $\frac{1}{8}$	15 $\frac{1}{4}$	15 $\frac{3}{4}$	9
14	25 $\frac{1}{2}$	8 $\frac{1}{2}$	23 $\frac{5}{8}$	17 $\frac{1}{2}$	14
19	32	11 $\frac{1}{2}$	27	24	20
24	41 $\frac{1}{4}$	15 $\frac{1}{8}$	34 $\frac{1}{2}$	29 $\frac{3}{8}$	20



Partial List of Vessels Using Our Search Lights

Steamer "Childs," Key West, Fla.
 "Minnetonka," Rat Portage, Ont.
 "Clipper," Rat Portage, Ont.
 "Natchez," New Orleans, La.
 "Queen City," Cincinnati, Ohio.
 "Lulu Prince."
 "Argand," Wheeling, W. Va.
 "Chisca," U. S., Memphis, Tenn.
 "Wm. Preston Dixon," U. S., Bowling Green, Ky.
 "Chas. H. Hamilton," Yukon River Boat.
 "T. C. Powers," Yukon River Boat.
 "John Cudahy," Yukon River Boat.
 "Electra," New Orleans, La.
 "Sunrise," New Orleans, La.
 "Gem," New Orleans, La.
 "City of Seattle," Tacoma, Wash.
 "Discovery," Seattle, Wash.
 "N. B. Forest," Chattanooga, Tenn.
 "J. C. Warner," Chattanooga, Tenn.
 "Otto Marmet," Cincinnati, Ohio.
 "Dudley," Nashville, Tenn.
 "Arundel," Detroit, Mich.
 "City of Erie," Cleveland, Ohio.
 "Arbutus," U. S. Lighthouse Tender, Mobile, Ala.
 "James Lee," Memphis, Tenn.
 "Georgie Lee," Memphis, Tenn.
 "St. James," New Orleans, La.
 "Gen. O. M. Poe," U. S., Carrollton, Ky.
 "Zanetta," Marietta, Ohio.
 "Major McKenzie," U. S., Louisville, Ky.
 "Tred. Avon," Baltimore, Md.
 "Vidette," U. S. Engineer's Tug, Philadelphia, Pa.
 "Burnside," Burksville, Ky.
 "Fortune Hunter," Alaska.
 "Kansas City," Alaska.
 "Martha Wilkes," Pacific Coast Steam Yacht.
 "Uncle Sam," Ft. Atkinson, Wis.
 "Minnetonka," U. S., St. Louis, Mo.
 "Stella Moren," Pittsburg, Pa.
 "Indiana," Cincinnati, Ohio.
 "Bonanza," Cincinnati, Ohio.
 "Sonoma," Beverly, Ohio.
 "Dirigo," Tacoma, Wash.
 "Falls City," Louisville, Ky.
 "Ferd Herold," Memphis, Tenn.
 "Ger. Bar Mining Co.," Virginia City, Mont.
 "Ouatoaga," Upper Mississippi.
 "Pennsylvania," Sandusky, Ohio.
 "Hancock," U. S., Detroit, Mich.
 "Mary," Mobile, Ala.
 "Alarm," New Orleans, La.
 "Crescent," New Orleans, La.
 "Exporter," New Orleans, La.
 "Whitney," New Orleans, La.
 "Chalmetti," New Orleans, La.
 "Excelsior," New Orleans, La.
 "Carrier," New Orleans, La.
 "Endeavor," New Orleans, La.
 "Esther," New Orleans, La.
 "Gouldsboro," New Orleans, La.
 "John N. Pharr," New Orleans, La.
 "F. B. Williams," New Orleans, La.
 "Yola," British Steamer.
 "Transit," Louisville, Ky.
 "Golden Rod," U. S., Cincinnati, Ohio.
 "U. & I.," Plaquemine, La.
 "T. H. Davis," Ohio River Steamer.
 "May Steward," Upper Ohio River.
 "City of Wheeling," Upper Ohio River.
 "Annie L.," Pomeroy, Ohio.
 "Porto Rico," Porto Rico, W. I.

Steamer "Pro Patria," French Liner, Boston, Mass.
 "Kanawha," Upper Ohio River.
 "Valley Belle," Upper Ohio River.
 "Sun," Upper Ohio River.
 "Darling," Upper Ohio River.
 "Eloise," Keokuk, Iowa.
 "D. T. Lane," Charleston, W. Va.
 "W. B. Calderwood," Charleston, W. Va.
 "Eliza," Belmont Coal Co., Bellaire, O.
 "Ruth," San Francisco, Cal.
 "Luella," San Francisco, Cal.
 "Aberdeen," San Francisco, Cal.
 "Santa Ana," San Francisco, Cal.
 "Helen M. Gould," Pt. Pleasant, W. Va.
 "Aid," Louisville, Ky.
 "Peters Lee," Memphis, Tenn.
 "Henry Harley," Memphis, Tenn.
 "Arthur Heider," Memphis, Tenn.
 "Rees Lee," Memphis, Tenn.
 "Rowena Lee," Memphis, Tenn.
 "Bayless Lee," Memphis, Tenn.
 "R. E. Lee," Memphis, Tenn.
 "Katie Lee," Memphis, Tenn.
 "Stella," Sabine Pass, Texas.
 "Argyle," Picton, Ont., Canada.
 "J. O. Cole," Cincinnati, Ohio.
 "John Barrett," Frankfort, Ky.
 "Arrow," Sandusky, Ohio.
 "Chas. Merriam," Gray's Point, Mo.
 "Tilley," Toronto, Ont., Canada.
 "Florence Marmet," Cincinnati, Ohio.
 "City of St. Louis," St. Louis, Mo.
 "Alexandria," Picton, Ont., Canada.
 "Hartford," Hartford, Conn.
 "Jessamine," U. S., Baltimore, Md.
 "Liberty," Middleport, Ohio.
 "Lyda," Paducah, Ky.
 "W. H. Buttorf," Nashville, Tenn.
 "Otero," Boston, Mass.
 "Penobscot," Boston, Mass.
 "Callender," Astoria, Ore.
 "Philip F. Kelly," Tacoma, Wash.
 "Cyclone," Cape Vincent, N. Y.
 "King," U. S., Jeffersonville, Ind.
 "Tahoma," Kalama, Wash.
 "Kelley."
 "Morning Star," Louisville, Ky.
 "Bailey Gatzert," Portland, Ore.
 "Beaver," Cincinnati, Ohio.
 "Voyager," Pittsburg, Pa.
 "Dale," U. S. Navy.
 "Decatur," U. S. Navy.
 "Pavonia," Paducah, Ky.
 "America," New Orleans, La.
 "City of Memphis," St. Louis, Mo.
 "Greenwood," Pittsburg, Pa.
 "Robert McKinley," Pittsburg, Pa.
 "Return," Pittsburg, Pa.
 "Frank Gilmore," Pittsburg, Pa.
 "Pacific No. 2," Pittsburg, Pa.
 "John Moren," Pittsburg, Pa.
 "Bob Connell," Pittsburg, Pa.
 "Sam Brown," Pittsburg, Pa.
 "W. C. Jutte," Pittsburg, Pa.
 "Winifrede," Pittsburg, Pa.
 "Sailor," Pittsburg, Pa.
 "Lookout," Pittsburg, Pa.
 "Kathryn," Pittsburg, Pa.
 "L. C. Woodward," Pittsburg, Pa.
 "Convoy," Pittsburg, Pa.
 "Keystone State," Pittsburg, Pa.
 "W. H. Flint," Pittsburg, Pa.
 "Francis Torrence," Pittsburg, Pa.
 "Jim Brown," Pittsburg, Pa.
 "Lee H. Brooks," Pittsburg, Pa.
 "J. K. Davidson," Pittsburg, Pa.

Steamer	"G. W. Moredock," Pittsburg, Pa.	Steamer	"Borealis Rex," Natchez, Miss.
"	"Oakland," Pittsburg, Pa.	"	"Bill Clark," Parkersburg, W. Va.
"	"Geo. W. Thomas," Pittsburg, Pa.	"	"Calvert," Charleston, W. Va.
"	"Vesta," Pittsburg, Pa.	"	"Virginia," Baltimore, Md.
"	"J. W. Ailes," Pittsburg, Pa.	"	"Crisfield," Norfolk, Va.
"	"City of Cincinnati," Cincinnati, Ohio.	"	"Canastoga," Philadelphia, Pa.
"	"Gate City," Cincinnati, Ohio.	"	"Gen. Theo. Schwan," U. S., Pittsburg, Pa.
"	"Tacoma," Cincinnati, Ohio.	"	"Carrie Brown," Gallipolis, Ohio.
"	"Relief," Cincinnati, Ohio.	"	"Delta," Pittsburg, Pa.
"	"Eagle," Cincinnati, Ohio.	"	"Helen White," White Bros., Fly, Ohio.
"	"Urania," Cincinnati, Ohio.	"	"Henry De Bus," Cincinnati, Ohio.
"	"Catherine Davis," Cincinnati, Ohio.	"	"E. Weyerhauser," Vicksburg, Miss.
"	"Val. P. Collins," Cincinnati, Ohio.	"	"Ocean Wave," San Francisco, Cal.
"	"Charley Brown," Pittsburg, Pa.	"	"Bob Blanks," New Orleans, La.
"	"Mariner," Pittsburg, Pa.	"	"Nellie Hudson," Ford City, Pa.
"	"Mulgrave," Mulgrave, N. S., Canada.	"	"Gen. H. L. Abbott," St. Louis, Mo.
"	"Harry Brown," Pittsburg, Pa.	"	"New England," Vancouver, B. C., Can.
Tug	"Fearless," Tacoma, Wash.	"	"Princess Beatrice," Vancouver, B. C., Canada.
Yacht	"Mina," Chicago, Ill.	"	"Island Queen," Cincinnati, Ohio.
"	"Marie," New Orleans, La.	"	"Courier," Cincinnati, Ohio.
"	"Genevieve," Mr. L. D. Fisk, Hartford, Conn.	"	"Beatrice Waring," St. John, N. B., Canada.
"	"Caprice," Mr. Miner Robinson, Boston, Mass.	"	"Wolverine," Selkirk, Man., Canada.
"	"Mabel," E. H. R. Green, Terrell, Texas.	"	"Modoc," Vicksburg, Miss.
"	"Neptune," New Orleans, La.	"	"Bowling Green," Evansville, Ind.
"	"Brook Hill," Paducah Yacht Club.	"	"Workum," Cincinnati, Ohio.
"	"Telka," New York City.	"	"Cumberland," U. S. Navy.
"	"Pryun," Detroit, Mich.	Yacht	"Gloria," Noank, Conn.
"	"Kid," Racine, Wis.	"	"Turtle," Boston, Mass.
"	"Morgan," Houghton, Mich.	"	"Evina B.," Manistee, Mich.
"	"Ramona," Cincinnati, Ohio.	"	"Ventura," Petersburg, Va.
"	"Dunnotar," Minneapolis, Minn.	"	"Tia Juana," Menasha, Wis.
"	"De Soto," St. Paul, Minn.	"	"Emma B.," Grand Rapids, Mich.
Steamer	"Rose Ilite," Pittsburg, Pa.	"	"Annie Russell," St. Louis, Mo.
"	"Crickett," Catlettsburg, Ky.	"	"Theotiste," St. Louis, Mo.
"	"Belle Prince," Natchez, Miss.	"	"Anita," Philadelphia, Pa.
"	"Robt. P. Gilham," Cincinnati, Ohio.	"	"Zora," Chicago, Ill.
"	"Crown Hill," Cincinnati, Ohio.	"	"Priscilla," Cleveland, Ohio.
"	"City of St. Joseph," Jefferson City, Mo.	Tug	"Will S. Wood," Vicksburg, Miss.
"	"Sadie Dourman," New Iberia, La.	"	"Active," Pittsburg, Pa.
"	"B. D. Wood," Pittsburg, Pa.	"	"Etta White," Vancouver, B. C., Can.
"	"Mystery," Vancouver, B. C., Canada.	"	"Fox," New Orleans, La.
"	"Gertrude," Pittsburg, Pa.	"	"Major," Louisville, Ky.
"	"Cassiar," Vancouver, B. C., Canada.	Steamer	"Bellview," Louisville, Ky.
"	"Madrona," U. S., San Francisco, Cal.	"	"John W. Thomas," Louisville, Ky.
"	"Centralia," San Francisco, Cal.	"	"Fulton," Louisville, Ky.
"	"I. S. Kimball," San Francisco, Cal.	"	"I. S.," Davenport, Iowa.
"	"Fulton," San Francisco, Cal.	"	"Col. Mackenzie," Rock Island, Ill.
"	"Pomo," San Francisco, Cal.	"	"Jack Frost," Cincinnati, Ohio.
"	"Brunswick," San Francisco, Cal.	"	"McClellan," St. Louis, Mo.
"	"Elizabeth," San Francisco, Cal.	"	"Stacker Lee," Memphis, Tenn.
"	"Sunol," San Francisco, Cal.	"	"Sadie Lee," Memphis, Tenn.
"	"Uncle Sam," San Francisco, Cal.	"	"St. Genevieve," St. Genevieve, Mo.
"	"Chas. Clark," Pittsburg, Pa.	"	"Sun," Memphis, Tenn.
"	"Evergreen," Pt. Pleasant, W. Va.	"	"Anderson Tully No. 1," Memphis, Tenn.
"	"Albion River," San Francisco, Cal.	"	"Anderson Tully No. 2," Memphis, Tenn.
"	"Cyclone," Pittsburg, Pa.	"	"Delta," Memphis, Tenn.
"	"Sugar Land," Morgan City, La.	"	"Kate Adams," Memphis, Tenn.
"	"Little Dick," Pittsburg, Pa.	"	"E. D. Allen," Little Rock, Ark.
"	"Fulton," Pittsburg, Pa.	"	"Conder," Joppa, Ill.
"	"Russell Lord," Paducah, Ky.	"	"Beaver," Barrett Line, Cincinnati, O.
"	"E. R. Andrews," Cincinnati, Ohio.	"	"T. F. Davis," Barrett Line, Cincinnati, Ohio.
"	"Margaret," Paducah, Ky.	"	"Barrett," Barrett Line, Cincinnati, O.
"	"R. A. Speed," Paducah, Ky.	"	"J. F. Buckham," Caseyville, Ky.
"	"Jim T. Duffy, Jr.," Paducah, Ky.	"	"Herman Poepcke," Cairo, Ill.
"	"Avalon," Chattanooga, Tenn.	"	"Big Kanawha," Pt. Pleasant, W. Va.
"	"St. Germain," Jeffersonville, Ind.	"	"Tennessee," Paducah, Ky.
"	"Pelican," Vicksburg, Miss.	"	"City of Memphis," Paducah, Ky.
"	"Baxter," Charleston, W. Va.	"	"City of Clifton," Paducah, Ky.
"	"Kistrell," Vancouver, B. C., Canada.	"	"City of Savannah," Paducah, Ky.
"	"S. B. Goucher," Marietta, Ohio.	"	"Shiloh," Paducah, Ky.
"	"J. C. Risher," Pittsburg, Pa.	"	"Clyde," Paducah, Ky.
"	"May Fischer," New Orleans, La.	"	"Dick Fowler," Paducah, Ky.
"	"Louis Hauck," Mound City, Ill.	"	"Joe Fowler," Paducah, Ky.
"	"H. P. Jones," Pittsburg, Pa.	"	"John S. Hopkins," Paducah, Ky.
"	"Slackwater," U. S., Pittsburg, Pa.	"	"Castalia," Paducah, Ky.
"	"Clyde," Pittsburg, Pa.	"	"Victor," Paducah, Ky.
"	"Valiant," Pittsburg, Pa.	"	"Geo. W. Cowling," Paducah, Ky.
"	"City of South Haven," South Haven, Mich.	"	"Osage," Paducah, Ky.
"	"Rival," Pittsburg, Pa.	"	"Guntersville," Guntersville, Ala.
		"	"City of Huntsville," Guntersville, Ala.

ELECTRIC SEARCHLIGHTS.



Steamer "Liberty," Mobile, Ala.
 "Mary," Mobile, Ala.
 "M. W. Kelly," Columbus, Ga.
 "Red River," New Orleans, La.
 "H. M. Carter," New Orleans, La.
 "Columbia," New Orleans, La.
 "City of Camden," New Orleans, La.
 "Frank B. Hayne," New Orleans, La.
 "Alma," New Orleans, La.
 "Martha H. Henning," Evansville, Ind.
 "Nellie Willitt," New Albany, Ind.
 "Gold Dust," Louisville, Ky.
 "E. G. Ragan," Louisville, Ky.
 "Gleaner," Pittsburg, Pa.
 "Charlie Jutte," Pittsburg, Pa.
 "Crescent," Pittsburg, Pa.
 "R. L. Aubrey," Pittsburg, Pa.
 "Robert Taylor," Pittsburg, Pa.
 "Ford City," Pittsburg, Pa.
 "P. M. Pfeil," Pittsburg, Pa.
 "Columbia," Pittsburg, Pa.
 "Harvester," Pittsburg, Pa.
 "Francis J. Torrence," Pittsburg, Pa.
 "Mayflower," Pittsburg, Pa.
 "John C. Fisher," Pittsburg, Pa.
 "H. P. Dilworth," Pittsburg, Pa.
 "John F. Klein," Pittsburg, Pa.
 "Andrew Axton," Pittsburg, Pa.
 "Diamond," Pittsburg, Pa.
 "F. K. Huling," Pittsburg, Pa.
 "Harmony," Pittsburg, Pa.
 "Eleanor," Pittsburg, Pa.
 "Clifton," Pittsburg, Pa.
 "Elizabeth," Pittsburg, Pa.
 "Hidalgo," Mexico City, Mexico.
 "Jas. Deitrick," Nicaragua, C. A.
 "J. E. Leonard," Brownsville, Pa.
 "Merchants Coal Co.," Boswell, Pa.
 "Steel Queen," Pittsburg, Pa.
 "Lock No. 1," U. S., Pittsburg, Pa.
 "Eliza," Pittsburg, Pa.
 "Alice Brown," Pittsburg, Pa.
 "Boaz," Pittsburg, Pa.
 "Chas. Hook," Pittsburg, Pa.
 "Crusader," Pittsburg, Pa.
 "Cruiser," Pittsburg, Pa.
 "Clipper," Pittsburg, Pa.
 "Carbon," Pittsburg, Pa.
 "Coal City," Pittsburg, Pa.
 "Dave Wood," Pittsburg, Pa.
 "Defender," Pittsburg, Pa.
 "Ed. Roberts," Pittsburg, Pa.
 "Enterprise," Pittsburg, Pa.
 "Exporter," Pittsburg, Pa.
 "Fallie," Pittsburg, Pa.
 "Fred. Wilson," Pittsburg, Pa.
 "Iron Age," Pittsburg, Pa.
 "I. V. Bunton," Pittsburg, Pa.
 "James Moren," Pittsburg, Pa.
 "Jim Wood," Pittsburg, Pa.
 "Jos. B. Williams," Pittsburg, Pa.
 "Josh Cook," Pittsburg, Pa.
 "Little Fred," Pittsburg, Pa.
 "Monterey," Pittsburg, Pa.
 "Ranger," Pittsburg, Pa.
 "Raymond Horner," Pittsburg, Pa.
 "Samuel Clark," Pittsburg, Pa.
 "S. H. H. Clark," Pittsburg, Pa.
 "Sprague," Pittsburg, Pa.
 "Tom Lysle," Pittsburg, Pa.
 "Tom Dodswoorth," Pittsburg, Pa.
 "Tom Rees No. 2," Pittsburg, Pa.
 "Tornado," Pittsburg, Pa.
 "Volunteer," Pittsburg, Pa.
 "Wilmot," Pittsburg, Pa.
 "Wash Gray," Pittsburg, Pa.
 "Wash Honshell," Pittsburg, Pa.
 "Gazelle," Hawesville, Ky.
 "Vienna," Columbus, Miss.
 "Atlantic," Galveston, Tex.
 "Tarascon," Louisville, Ky.
 "Parlor City," Louisville, Ky.
 "Hennen," Evansville, Ind.

Steamer "Annapolis," City of Baltimore, Md.
 "Latrobe," City of Baltimore, Md.
 "Verne Swain," Peoria, Ill.
 "Senlac," St. John, N. B., Canada.
 "Elaine," St. John, N. B., Canada.
 "Maude Kilgore," Helena, Ark.
 "Fritz," Paducah, Ky.
 "Frances," Evansville, Ind.
 "Bristol," Baltimore, Md.
 "Mary S. Blees," Mobile, Ala.
 "Virgie," Burnside, La.
 "Illinois," Quincy, Ill.
 "T. P. Roberts," U. S., Pittsburg, Pa.
 "S. S. Brown," Pittsburg, Pa.
 "Jenny Louise," Plaquemine, La.
 "Geo. P. Egan," Pittsburg, Pa.
 "Crescent," Pittsburg, Pa.
 "Clara Ramos," Mexico.
 "Albatros," Vicksburg, Miss.
 "Josephine," Sioux City, Iowa.
 "Tennessee," St. Louis, Mo.
 "Harmony," Pittsburg, Pa.
 "M. D. Weyman," Pittsburg, Pa.
 "Independent," Pittsburg, Pa.
 "Blue Spot," Paducah, Ky.
 "C. R. Suter," U. S., St. Louis, Mo.
 "H. M. Moxie," Pittsburg, Pa.
 "Caucus," U. S., Greenport, N. Y.
 "Protector," Charleston, S. C.
 "Amy Hewes," Jeannerette, La.
 "Nugent," Louisville, Ky.
 "City of Benton Harbor," Benton Harbor, Mich.
 "Carrie B. Schwing," Plaquemine, La.
 "Henry A. Laughlin," Pittsburg, Pa.
 "Neva," Charleston, W. Va.
 "Chilo," Cincinnati, Ohio.
 "Oleander," Memphis, Tenn.
 "Blue Bell," Philadelphia, Pa.
 "Corsair," Pittsburg, Pa.
 "Luna," Boston, Mass.
 "Capitola," Detroit, Mich.
 "Leda," New York City.
 "Twilight," Pittsburg, Pa.
 "Buckeye," West Wheeling, Ohio.
 "E. T. Slider," New Albany, Ind.
 "Norka," New York City.
 "Ildico," Yarmouth, Mass.
 "J. J. McGuirl," New York City.
 "Chaperon," Evansville, Ind.
 "Sumac," Manitowoc, Wis.
 "Crescent City," Evansville, Ind.
 "Chas. B. Pearce," Louisville, Ind.
 "Berkeley," San Francisco, Cal.
 "Carlos," San Francisco, Cal.
 "Casco," San Francisco, Cal.
 "Cascade," San Francisco, Cal.
 "Campanero," San Francisco, Cal.
 "Dennis Sullivan," San Francisco, Cal.
 "David Scannell," San Francisco, Cal.
 "F. S. Loop," San Francisco, Cal.
 "Gen. Frisbie," San Francisco, Cal.
 "Geo. H. Bailey," San Francisco, Cal.
 "Gov. Markham," San Francisco, Cal.
 "Gov. Irwin," San Francisco, Cal.
 "Helene," San Francisco, Cal.
 "Johan Poulsen," San Francisco, Cal.
 "Lurline," San Francisco, Cal.
 "Norwood," San Francisco, Cal.
 "Navigator," San Francisco, Cal.
 "Northland," San Francisco, Cal.
 "Ocean Wave," San Francisco, Cal.
 "R. D. Inman," San Francisco, Cal.
 "Raymond," San Francisco, Cal.
 "Rosecrans," San Francisco, Cal.
 "San Jacinto," San Francisco, Cal.
 "Sybil Marston," San Francisco, Cal.
 "Shasta," San Francisco, Cal.
 "Shoshone," San Francisco, Cal.
 "State Dredger No. 3," San Francisco, Cal.
 "Willapa," San Francisco, Cal.
 "Yellowstone," San Francisco, Cal.
 "Yosemite," San Francisco, Cal.



ELECTRIC SEARCHLIGHTS.

Yacht "Peerless," San Francisco, Cal.
"Allegro," Essington, Pa.
"Geneva," Richmond, Va.
"Willie R," Mobile, Ala.
Steamer "Antoinette," Evansville, Ind.
"Wabash," Henderson, Ky.
"L. S. Thorne," New Orleans, La.
"Katherine," Santiago, Cuba.
"Katherine," Mt. Vernon, Ind.
"Chas. H. Organ," Memphis, Tenn.
"Quill," Mobile, Ala.
"Spokane," Coeur D'Alene, Idaho.
"North Star," Coeur D'Alene, Idaho.
"Wallace," Coeur D'Alene, Idaho.
"Colfax," Coeur D'Alene, Idaho.
"Milwaukee," Coeur D'Alene, Idaho.
"Lucile," Mobile, Ala.
"Isaac M. Mason," Pittsburg, Pa.
"H. St. L. Coppee," Vicksburg, Miss.
"Muskogee," Muskogee, Okla.
"John W. Love," Cincinnati, Ohio.
"James Rumsey," Charleston, W. Va.
"Edith H.," Grantsville, W. Va.
"A. D. Allen," Little Rock, Ark.
"Wm. Garig," New Orleans, La.
"W. T. Hardison," Nashville, Tenn.
"Cumberland," Nashville, Tenn.
"Chas. W. Parke, Jr.," Bath, Maine.
"Ann Arbor No. 4," Ann Arbor, Mich.
"L. C. Hanna," Cleveland, Ohio.
"Chilcote," Vancouver, B. C., Canada.
"Escort No. 2," Vancouver, B. C., Can.
"Sea Lion," Vancouver, B. C., Canada.
"Commodore," Vancouver, B. C., Can.
"St. Clair," Vancouver, B. C., Canada.
"Active," Vancouver, B. C., Canada.
"Belle," Vancouver, B. C., Canada.
"Etta White," Vancouver, B. C., Can.
"Comet," Vancouver, B. C., Canada.
"Dauntless," New Westminster, Canada.
"Peerless," New Westminster, Canada.
"Fearless," New Westminster, Canada.
"Vulcan," New Westminster, Canada.
"Ivanhoe," Vancouver, B. C., Canada.
"Arcates," Vancouver, B. C., Canada.
"Iroquois," Vancouver, B. C., Canada.
"Chicftain," Essington, Canada.
"Storm King," Vancouver, B. C., Can.
"Dola," Vancouver, B. C., Canada.
"McCollock," Vancouver, B. C., Can.
"Bowman," Comaplix, B. C., Canada.
"May E. Staples," Mobile, Ala.
"James T. Staples," Mobile, Ala.
"Betha," Mobile, Ala.
"Hardecost," Mobile, Ala.
"John Quill," Mobile, Ala.
"J. P. Scherk," Mobile, Ala.
"Powell Stackhouse," Cleveland, Ohio.
"Republic," Cleveland, Ohio.
"Warner," Cleveland, Ohio.
"Fitch," Cleveland, Ohio.
"La Belle," Cleveland, Ohio.
"Wm. A. McGonagle," Duluth, Minn.
Yacht "Susquehanna," Baltimore, Md.
"Alcora," Baltimore, Md.
"Ilse III," Philadelphia, Pa.
"Lookout," U. S., Kingman, Ala.
"Bellevue," Evansville, Ind.
"Sachem," Detroit, Mich.
"Sirius," New York City.
"Old Reliable," Evansville, Ind.
"D. A. Nisbet," Evansville, Ind.
"Chief Wawatan," St. Ignace, Mich.
"J. A. Chanslor," Newport News, Va.
"Kentucky," U. S., Frankfort, Ky.
"Florida," Sabine Pass, Texas.
"Crescent," Jacksonville, Fla.
"Oliver H. Perry," Port Clinton, Ohio.
"Scwanee," Patterson, La.
"Rapids," Memphis, Tenn.
"Plow Boy," Duluth, Minn.
"C. G. S. Christine," Quebec, Canada.
"Bertha," Plaquemine, La.

Yacht "Ohio," Cincinnati, Ohio.
"St. Claire," Detroit, Mich.
"Athlone," Seattle, Wash.
"Inland Flyer," Seattle, Wash.
"Portland," Valdez, Alaska.
"Corwin," Nome, Alaska.
"Mary C.," Everett, Wash.
"Perdita," Seattle, Wash.
"Schwarka," Nome, Alaska.
"Julia B.," Nome, Alaska.
"Whidby," Seattle, Wash.
"Grant," Seattle, Wash.
"Hoquiam," Hoquiam, Wash.
"Juanita," Seattle, Wash.
"Lady May," Seattle, Wash.
"Wigwam," Seattle, Wash.
"Yakima," Seattle, Wash.
"Hyak," Seattle, Wash.
"Kitsap," Seattle, Wash.
"State of Washington," Seattle, Wash.
"Victoria," Seattle, Wash.
"Kennedy," Seattle, Wash.
"Bertha," Valdez, Alaska.
"Cottage City," Seattle, Wash.
"Dauntless," Seattle, Wash.
"Indianapolis," Seattle, Wash.
"Iroquois," Seattle, Wash.
"Phil. F. Kelly," Northern Waters.
"T. C. Reed," Tacoma, Wash.
"City of Seattle," Skagway, Alaska.
"Santa Ana," Seattle, Wash.
"Vashonian," Seattle, Wash.
"Kingsway," Vancouver, B. C., Can.
"Roman," New Westminster, B. C., Can.
"Lockport," Lockport, La.
"J. H. Menge," New Orleans, La.
"Climax," Lockport, La.
"Magnolia," New Orleans, La.
"Laura Sutcliffe," Franklin, La.
"Joe Birg," Franklin, La.
"Jennie Barbour," Franklin, La.
"Louisa," New Orleans, La.
"Josephine Louisa," New Orleans, La.
"Grover Cleveland," New Orleans, La.
"Saccharine," New Orleans, La.
"Houma," New Orleans, La.
"F. M. Owens," New Orleans, La.
"Terrebonne," New Orleans, La.
"Gregory," U. S., Kentucky River.
"Plaquemine," U. S., New Orleans, La.
"Waco," U. S., Waco, Texas.
Steamer "Shawnee," U. S., Green River.
"F. M. Owens," Helena, Ark.
"Nashville," Nashville, Tenn.
"Ed. Myers," Nashville, Tenn.
"City of Florence," Florence, Ala.
"G. W. Hill," St. Louis, Mo.
"Sidney," St. Louis, Mo.
"Aberdeen," San Francisco, Cal.
"Brunswick," San Francisco, Cal.
"Centralia," San Francisco, Cal.
"Coalinga," San Francisco, Cal.
"Capital City," San Francisco, Cal.
"Colusa," San Francisco, Cal.
"Doris," San Francisco, Cal.
"Elizabeth," San Francisco, Cal.
"El Aguador," San Francisco, Cal.
"Fulton," San Francisco, Cal.
"Fifield," San Francisco, Cal.
"Fort Bragg," San Francisco, Cal.
"Madrona," San Francisco, Cal.
"Liberty," San Francisco, Cal.
"Monticello," San Francisco, Cal.
"Peerless," San Francisco, Cal.
"Phyllis," San Francisco, Cal.
"Pomo," San Francisco, Cal.
"Santa Clara," San Francisco, Cal.
"Resolute," San Francisco, Cal.
"San Jacinto," San Francisco, Cal.
"Willamette," San Francisco, Cal.
Yacht "Wolverine," Helena, Ark.
"Vera," Provincetown, Mass.
"Thais," Monument Beach, Mass.

ELECTRIC SEARCHLIGHTS.



Yacht "Osceola," New York City.
 "Flowin," New York City.
 "Joyeuse," New York City.
 "Edemena," Fall River, Mass.
 "Maple Leaf," Vancouver, B. C., Can.
 "Enilada," Vancouver, B. C., Canada.
 "Josephine," New Orleans, La.
 "Lurline," New Orleans, La.
 "Desoto," New Orleans, La.
 "Elizabeth," New Orleans, La.
 "Yukpa," New Orleans, La.
 "Ruby May," Raceland, La.
 "Pineland," Houltonville, La.
 "Japonica," Orange, Texas.
 "Eilcen," New York City.
 "Tarolinta," New London, Conn.
 "Minnie W.," New York City.
 "Madagar II," New York City.
 "Elmesada," Buffalo, N. Y.
 "Caroline," New York City.
 "Itasca I," Duluth, Minn.
 "Cynthia II," New York City.
 "La Cynge," Toronto, Ont., Canada.
 "Irene II," Alexandria Bay, N. Y.
 "Josephine," New York City.
 "Verdi," Clayton, N. Y.
 "Sultana," Newport News, Va.
 "Wetew," New York City.
 "President," New York City.
 "Owlet," New York City.
 "W. H. Thompson," St. Louis, Mo.
 "Magnet," Providence, R. I.
 "Arval," New York City.

Yacht "Itasca II," Duluth, Minn.
 "Tekla," New York City.
 U. S. Dredge "Ram," U. S., New Orleans, La.
 Tug "Harrison," Owen Sound, Ont., Canada.
 "Lorne," Seattle, Wash.
 "Resolute," Port Gamble, Wash.
 "Nellie Pierson," Everett, Wash.
 "Hydra," Vancouver, B. C., Canada.
 "Spartan," Chemainus, B. C., Canada.
 "Nanoose," Vancouver, B. C., Canada.
 "Clayburn," Vancouver, B. C., Canada.
 "J. C. & B.," John Chouest, Raceland, La.
 Launch "Sunset Boat and Engine Co.," Ballard, Wash.
 "Helen Johnson," Vashon Island, Wash.
 Dredger "No. 3," San Francisco, Cal.
 Dredger "Uncle Sam," San Francisco, Cal.
 U. S. S. "Dorothea," Ohio Naval Militia, Cleveland, Ohio.
 U. S. S. "Melville," Torpedo Boat Destroyer Tender.
 U. S. S. "New York," Battleship.
 U. S. S. "Ericsson," Destroyer, U. S. Navy.
 Steamer "Tashmoo," Detroit, Mich.
 "Secandbee," Cleveland, Ohio.
 "G. W. Nixon," Burnside, Ky.
 Tug "Squaw," Orange, Texas.
 "Protector," Savannah, Ga.
 Launch "Warrior," Pacific American Fisheries Co., Seattle, Wash.
 "Lummi," Lummi Island Packing Co., Washington.
 Fire Boat "David Campbell," Portland, Ore.

Testimonial Letters and Photographs of Various Steamers and Other Craft on which Our Search Lights have been Installed

The Carlisle & Finch Co., Cincinnati, Ohio.

PARKERSBURG, W. VA., March 29, 1905.

Gentlemen—Have used several of your Search Lights, and they have so far given us entire satisfaction, and we consider it a pleasure to recommend same.

Yours truly,

LEWIS POPE & SONS,

Per B. S. Pope.



Str. Sprague, M. R. C. C. & C. Co., Pittsburgh, Pa.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURGH, PA., April 1, 1905.

Gentlemen—When your company assigned me the agency for your Search Lights for Pittsburgh and vicinity in 1900, there was only one of your make here. This was a 3,000 candle-power. Since that time over one hundred Pittsburgh steamboats have been equipped with Carlisle & Finch Co. Search Lights, and they are mostly of 4,000 and 6,000 and 8,000 candle power capacity. Several of these are mirror reflector, 40-degree dispersion lenses. A number of the larger tow-boats have two search lights each, and four of the largest tow-boats have three each. I am pleased to inform you that every one of them are giving entire satisfaction; I never hear one word of complaint from the users, and am often told by members of the different crews that the search light on their boat is the best on the river.

8 Wood Street.

Very truly yours,

J. M. DAVIS.

The Carlisle & Finch Co., Cincinnati, Ohio.

ON BOARD STEAMER "CRICKET," March 17, 1902.

Gentlemen—We have on board one of your 2,000 C. P. Search Lights, which has worked to perfection since it was put on [last August], and we will soon be in need of more carbons for it.

Yours truly,

JESSE B. HUGHES, Catlettsburg, Ky.

ELECTRIC SEARCHLIGHTS.



The Carlisle & Finch Co., Cincinnati, Ohio.

SAN FRANCISCO, CAL., May 28, 1909.

Gentlemen — We take pleasure in handing you herewith partial list of some of the vessels equipped with your Search Lights, built and operating on this Coast during the last nine years.

It is a matter of some satisfaction for us to say that of all these vessels, we seldom hear of any complaint on account of the Search Light. They are placed on a class of vessels that see very hard service and have to depend very much on their lights when going into outside Ports.

The fact that many of your lamps are sold on repeat order is the best testimonial we could give you, and we take pleasure in recommending your light to anybody wanting a good strong and reliable light.

Very truly yours,
HERZOG & DAHL.



Str. Crisfield, Norfolk, Va.

The Carlisle & Finch Co., Cincinnati, Ohio.

CINCINNATI, OHIO, May 14, 1904.

Gentlemen — Replying to yours of the 13th inst., we have used a good many of your Search Lights during the past eight years, and they have given perfect satisfaction. The boats on which they have been placed are among the best known steamers on the Western rivers. The Search Lights have given such good satisfaction, that they have become recognized as the standard for this class of apparatus, and are generally demanded by our trade. We take pleasure in stating we have had a number of duplicate orders.

Trusting this will give you the desired information, we remain,

Yours very truly,

THE TRIUMPH ELECTRIC CO.

The Carlisle & Finch Co., Cincinnati, Ohio.

KNAPPTON, WASHINGTON, Sept. 12, 1902.

Gentlemen — On November 5, 1900, you shipped to us one 9-inch Search Light, at the same time saying that you hoped the light would prove so satisfactory that it would lead to other orders. Our light did prove very satisfactory, and on the strength of it there have been six or seven 9-inch and several larger ones placed on Columbia River boats, and all are giving best of results. We are now building another tug, and want a duplicate of our last light, namely, one 9-inch lens Mirror Form 3, brass case and iron stand. You will please ship this by freight some time in the next sixty days.

Yours truly,

COLUMBIA MILLS,
Per M. P. Callender.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

ST. JOHN, N. B., CANADA, May 27, 1904.

Gentlemen — Having purchased through the R. E. T. Pringle Co., of this city, three of your 5,000 C. P. Form 3-M Pilot House Projectors, and installed them on the Steamers "Senlac," "Elaine" and "Beatrice Waring," I take great pleasure in recommending same, which have given satisfactory results in every respect.

Yours very truly,

FRANK P. VAUGHAN, *Electrical Engineer.*



Sir, Grand Haven, Grand Trunk R. R. Co., Grand Haven, Mich.

The Carlisle & Finch Co., Cincinnati, Ohio.

POINT PLEASANT, W. VA., May 10, 1904

Gentlemen — Your favor asking if we had found your Search Lights to be satisfactory, is hand, and in reply will say that we have your make of Search Lights on all our steamers. We put two of your lights on our steamers "D. T. Lane" and "W. B. Calderwood," about six years ago, and one each on the "Robert P. Gilliam," in 1902, and on the "E. R. Andrews," in 1901. The captain on each boat thinks he has the best light on the river, that is, that the light on his boat is the very best.

We have found your make of lights to be very satisfactory; more so than any others we have used — so much more so in fact that we do not even think of using any other make, as I find you keep your lights up to improvements, abreast of the times and electrical progress. The only repairs we have found necessary, was to renew such parts as would be damaged or burned by carelessness and inattention to the lights by the light tenders.

Yours truly,

THE CAMPELL'S CREEK COAL CO.,
E. A. BURNSIDE, *Mgr. Trans. and Pur. Dept.*

ELECTRIC SEARCHLIGHTS.



The Carlisle & Finch Co., Cincinnati, Ohio.

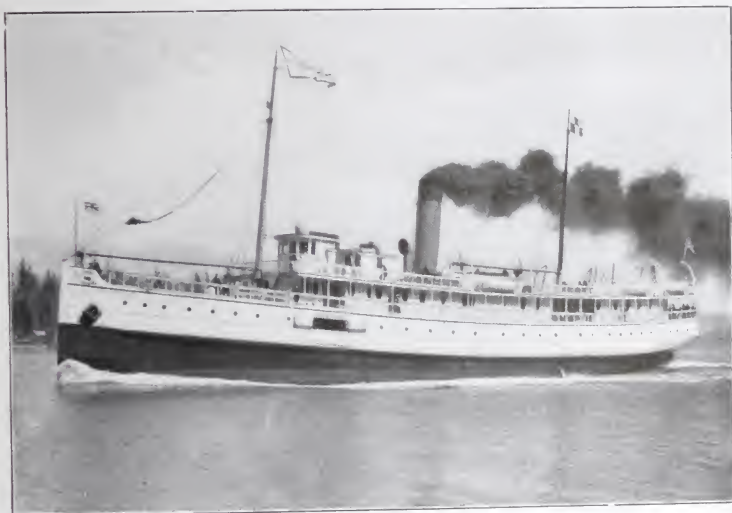
CINCINNATI, OHIO, May 12, 1904.

Gentlemen — Answering your inquiry regarding my experience with your Search Lights, beg to state that in my fourteen years of marine work I have come in contact with nearly every search light made, and I am pleased to state that I have got better results from yours than from any of the others; not only in the amount of light delivered, but the general simplicity of the lamp. Its construction is such that our ordinary steamboat watchman can take care of them and have very little trouble. When they do get out of order, their general simplicity is such that repairs are very easily made. I think your lamp so much more superior to any other that our specifications always call for your lamp when we equip any of our new boats.

Yours respectfully,

CHAS. A. AULL,

Chief Elec., Louisville and Cincinnati Packet Co.



Str. Princess Beatrice, Vancouver, B. C.

PITTSBURGH, PA., March 25, 1905.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — We purchased two 6,000 C. P. Search Lights through your representative, Capt. J. M. Davis, of this city, one for the steamer "Harvester," formerly owned by us, and one for the steamer "Frank Gilmore," now in our service. These Search Lights have given universal satisfaction, and we cheerfully recommend them to anyone wanting a good and durable Search Light.

Yours very truly,

THE A. R. BUDD COAL CO.,

Per E. G. Bolles, Secretary

PITTSBURGH, PA., April 1, 1905.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Within the last few years we have placed on steamboats, owned and operated by this Company, your Search Lights to the following number: One 2,000 C. P., twenty-one 4,000 C. P., seventeen 6,000 C. P., twenty-one 8,000 C. P. Words of praise for your Search Lights would be superfluous by the side of figures so concise and so convincing.

Very truly yours,

MONONGAHELA RIVER CONSOLIDATED COAL & COKE CO.,

Per W. H. Crump, Master Trans.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

LOUISVILLE, KY., May 9, 1904.

Gentlemen — We have your favor of the 7th inst., and note contents.

It affords us pleasure to say that we have sold to others and used in connection with our own contract work, quite a number of different styles of your Search Lights. For ease and simplicity of adjustment, we consider them unsurpassed by anything on the market today. They are symmetrical in design, and the workmanship and general results obtained from same are certainly all that could be expected from an article of this character.

We might say in connection with this that the majority of inquiries coming to us from outright purchasers of Search Lights, specify those of your make. This goes to show the esteem in which they are held in this section of the country, and that south of us.

We regret that we have no photos of the vessels on which we have installed lamps of your manufacture.

313-315 West Main Street.

Yours very truly,

JAS. CLARK, JR., & CO.



Str. Klamath, San Francisco, Cal.

The Carlisle & Finch Co., Cincinnati, Ohio.

Boston, Jan. 2, 1900.

Dear Sirs — I have been using one of your Search Lights on my steam launch, the "Caprice," for the past two years, and it has been giving perfect satisfaction.

Yours respectfully,

MINER ROBINSON.

The Carlisle & Finch Co., Cincinnati, Ohio.

Pittsburgh, Pa., April 1, 1905.

Gentlemen — Replying to your inquiry would say: about three years ago we bought from your company one 8,000 candle power Search Light for our tow boat steamer, "W. H. Flint." It has been in constant use and is giving the very best service. Recently we ordered a brass case from you for this lamp. If we were equipping other steamboats you would get the order for a duplicate of the one on the steamer "W. H. Flint."

Yours respectfully,

W. H. FLINT,

Mgr. Owner, Iron City Coal Co.

ELECTRIC SEARCHLIGHTS.



The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURGH, PA., March 31, 1905.

Gentlemen — Replying to your inquiry, beg to say that I have superintended the construction of several towboats here within the past five years; every one of them being equipped with the Carlisle & Finch Co. Search Light. In fact, our steamboat owners will not buy any other since they have compared yours with other makes. I have placed orders with your Pittsburgh representative for five Search Lights and they are all giving the very best results. I ordered last week another 4,000 c. p., Form 2-C, for our new boat, "Harmony." She is almost ready to go into commission. Wishing you and your Search Lights continued success, I am,

Yours truly,

C. W. POSEY, *Supt. Construction.*



Yacht Susquehanna, Baltimore, Md.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURGH, PA., March 29, 1905.

Gentlemen — Answering your inquiry, I beg to say I received from your company, in the Fall of 1901, one 8,000 c. p. brass case, mirror reflector 40-degree dispersion lens Search Light for the steel-hull boat "Vesta," owned by the Vesta Coal Co., of this city. The light has been in constant use and has given entire satisfaction. I have just contracted for another new steel-hull tow-boat for the same company and will be in the market for another first-class Search Light. There is nothing made too good for our boats, and you may expect to get the order for the new boat.

Yours truly,

W. EISEY,
Per Vesta Coal Co.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURGH, PA., March 30, 1905.

Gentlemen — Replying to your inquiry, I beg to say that I was a towboat pilot on the Ohio River long before the days of Electric Search Lights, and have been boating right along since Search Lights have come into general use. I have been employed as pilot on some of the very best boats at this port, and most all the boats here have fine electric plants. I have made several trips on the towboat "Clyde," belonging to the Clyde Coal Co., of this city. This boat has one of your 8,000 C. P. Mirror Reflector Search Lights. It is a fine lamp and certainly turns darkness into daylight.

Yours very truly,

HOLMES HARGER, SR.

PITTSBURG, PA., March 27, 1905.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Answering your inquiry as to my opinion of your Search Light, I beg to say that, as an electrician, I have wired and fitted up sixteen steamboats in the past five years, and every one of them was equipped with Carlisle & Finch Search Lights. I have never had any trouble with them. They all gave satisfaction from the start and continue to do so. Your Search Lights can be kept in working order for a long time at a very nominal expense by ordering duplicate parts, which are very inexpensive.

Yours truly,

J. S. DAWSON, 5147 Carnegie Ave.



Str. City of South Haven, Chicago, Ill.

HALIFAX, N. S., Dec. 28, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Dear Sirs — Replying to yours of the 22d inst., would say that the Search Lights of yours which we have installed are giving good satisfaction, and we are pleased to recommend them.

Yours very truly,

JOHN STARR, SON & CO., Ltd.

C. C. Starr, Sec'y and Treas.

PICTON, ONT., Dec. 9, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Dear Sirs — I have yours of December 7th. The Search Light purchased from you for our new steamer, "Argyle," has worked in a satisfactory manner, and I can highly recommend this Search Light to any person looking for a light suitable for marine use. I am,

Yours truly,

LAKE ONTARIO NAV. CO., Ltd.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

SHERBROOKE, P. Q., CANADA.

Gentlemen— We would be pleased to receive your catalogue of Marine Search Lights. We have three of your 9-inch mirror lens machines, which we purchased in April, 1909, through Mr. John Forman. They are in use on our tugs, and may say the only attention they have had so far was to put in carbons and turn on the "juice." We are building a new boat this winter, and are going to equip her and one other with lights, so would be pleased to receive your latest catalogue, with your best prices on both the 9-inch and 14-inch machines.

Very truly,

J. E. McCREA,

Bromington Pulp and Paper Co.



David Scannell, San Francisco Fire Boat

Pittsburg, Pa., September 27, 1911.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen— Answering your inquiry regarding my experience with your Search Light in connection with the Dispersion Lens for spreading out the light. My company bought one of your 19-inch case, 4,000 C. P. Search Lights, together with your Dispersion Lens. We used it during the building of Locks and Dams No. 4 and No. 18, on the Ohio River. We obtained excellent results, as the light was spread out about 100 feet wide and 1,000 feet distant from the Search Light, producing a soft, mellow light, free from harsh shadows. Our men worked from dark until daylight without any inconvenience. I know of several other contracting companies using your Search Lights in connection with the Dispersion Lens getting satisfactory results.

I also bought one of your Search Lights for my tugboat, "Egan." During the time I operated the boat my crew was well pleased with the light.

Yours truly,

GEO. F. EGAN, Contractor.

ELECTRIC SEARCHLIGHTS.

PITTSBURG, PA., March 31, 1905.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — In response to your inquiry as to what satisfaction we are deriving from your Search Lights, we take pleasure in saying that we have a 4,000 C. P. light on the steamer "Eleanor," and an 8,000 C. P. mirror reflector light on the steamer "Clyde." Both of these lights are giving entire satisfaction, and if we were to build a new steamboat, we would consider no other light but yours.

Very respectfully,

THE CLYDE COAL CO.,

Per J. H. SANFORD, G. M.



Yacht Allegro, Philadelphia, Pa.

WHEELING, W. VA., December 28, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — In reply to yours of the 22d, would say that about one year ago we sold one of your Search Lights, 6,000 C. P., to the Belmont Coal Co., Bellaire, Ohio, for their steamer, "Eliza," and they can not say too much in praise of your lamp, and it has been the means of our selling a great deal of material to river men in this section.

We have bid on several of your lamps lately, and hope to secure some of the orders.

Very truly yours,

H. S. SANDS ELEC. AND MFG. CO.

PITTSBURG, PA., March 30, 1905.

The Carlisle & Finch Co., Cincinnati, Ohio.

Dear Sirs — I bought one of your 4,000 C. P. Search Lights in the summer of 1903 for my new towboat, "J. E. Leonard." It has been in constant use and am pleased to inform you that it is giving the very best service. I think I have one of the best Search Lights on the Monongahela River, and would recommend the Carlisle & Finch Co. make of Search Lights to anyone wanting a first-class light.

Wishing you continued success, I am,

Yours truly,

JOHN E. LEONARD, Brownsville, Pa.

ELECTRIC SEARCHLIGHTS.

STEINWAY, L. I., N. Y., January 25, 1906.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — We are sending you a photograph of the engine-room on the "Norka," our contract No. 136. This is the vessel on which the 3 K-W. set which you sent us for the Government was installed. This photograph may be of use to you in your advertising department, in case you desire to push your direct-connected generating sets.

We beg to say in regard to this outfit that the machine worked satisfactorily. The very fact that the U. S. Government has one of your gasoline sets directly installed in the largest motor boat that has ever been built for them, would be an attractive feature in your advertisements for this class of work.

Very truly yours,

WILLIAMS-WHITTELSEY CO.



Dennis T. Sullivan, San Francisco Fire Boat

HIGH BRIDGE, KY., December 8, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Two of your 2,000 C. P. Search Lights have been in use on the U. S. S. "Gen. O. M. Poe," for the past two years, and have given grand satisfaction. Parts are all simple and little to get out of order about them.

Very respectfully,

JAMES E. BROWNSKI,

Master U. S. Steamer "Gen. O. M. Poe"

N. S. PITTSBURG, PA., September 21, 1911.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — I beg to say that on November 5, 1909, I installed two 14-inch Form 3-M. 5,000 C. P. Search Lights on the Northeast and Southeast Towers in the Western Penitentiary of Pennsylvania. Both of these lights have been in constant use, and I am pleased to advise you that they have given entire satisfaction since their installation. Words of praise for your Search Lights would be superfluous in connection with the above statement. I heartily recommend your lights to any prospective purchasers.

Very truly yours,

E. V. BIRCH, Electrician.

ELECTRIC SEARCHLIGHTS.

PARKERSBURG, W. VA., December 29, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Dear Sirs — I have used your Search Lights for over two years. They have proven satisfactory in every respect, and not once have I been called on to repair or adjust one after setting.

Yours very truly,

J. W. UNDERWOOD.

PITTSBURG, PA., December 8, 1899.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Regarding the use of your Search Lights, we are very glad to advise you that they have given entire satisfaction.

Wishing you every success, we remain,

Yours very truly,

DOUBLEDAY-HILL ELECTRIC CO.,

H. M. DOUBLEDAY, *Mgr.*



Tug Ymir, Nelson, B. C.

Mr. J. M. Davis, 606 House Bldg., Pittsburg, Pa.

Dear Sir — A short time ago we purchased through you, two of the Carlisle & Finch Co.'s Search Lights, to be used on our tippie at Dorothy, W. Va. These lights have been in constant use and have been giving excellent satisfaction, and it is with pleasure we recommend them to anyone looking for equipment along this line.

Yours very truly,

M. F. McDERMOTT, *Purchasing Agent.*

NASHVILLE, TENN., February 26, 1900.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Your letter of December 22d to hand. I regret to say that I have been so very busy that I have failed to answer you. I must say that of all the lights I ever saw or used, I would rather have one of yours.

I would like for you to please price me at once one of your 14-inch lamps, to match the one I have. I have a 14-inch lamp, with the rod to move up and down. I want to put on two lamps at once. Please make me the price on the lamp as soon as you can.

Hoping to hear from you at once, I am,

Yours truly,

J. P. LOVELL.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

NELSON, B. C., November 16, 1910.

Gentlemen — I am pleased to write you a recommendation of the Search Lights you have at different times supplied for our floating equipment, particularly for the use of the steam tugs operating the heavy car transfer barges on the lakes covered by this service.

I have found them in all cases thoroughly reliable, and this in itself is a very important factor where we have the handling of such heavy equipment in limited space.

I find the workmanship high class, and the Search Lights give illumination that is ample for the purpose, and does not absorb too much energy from the generators on the boats.

Usually I have them placed on the roof of the pilot house, with controlling wheel on the ceiling of the house, handy for the wheelsman to use without releasing the steering wheel. So long as you maintain the good workmanship of the Search Light, and take advantage of any later improvements that can be made from time to time, I am prepared to use them on our equipment in preference to others.

Yours very truly,

J. C. GORE, *Superintendent.*



Str. Tashmoo, Detroit, Mich.

The Carlisle & Finch Co., Cincinnati, Ohio.

ALCATRAZ LANDING, CAL., January 3, 1900.

Gentlemen — In answer to your inquiry of recent date as to how we are satisfied with your Search Light, we would state that we have not had an opportunity yet to use it continuously, but, as far as we have used it, it has given entire satisfaction, and we expect to place another order for the duplicate of the one we have in the near future.

Yours truly,

THE ALCATRAZ CO.,

ARTHUR H. BELL, *Mgr.*

The Carlisle & Finch Co., Cincinnati, Ohio.

PADUCAH, KY., May 14, 1909.

Gentlemen — We are enclosing herewith order for one Form 2-C 3,000 C. P. Search Light. Kindly ship same immediately by I. C. Freight.

We have used several of your lights during the past season and we have found them to be more than satisfactory on every installation, and we can heartily say that they are the best sellers and will give better results than any other lamp manufactured.

We thank you for the many past favors extended us and beg to remain

Yours very truly,

FOREMAN BROTHERS ELECTRIC COMPANY,
R. O. GRESHAM, *Sec'y.*

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

HARTFORD, CONN., May 7, 1909.

Gentlemen — We have in use on our passenger steamers and towing steamers four of your Search Lights.

The first we installed on Steamer "Mabel" ten years ago and have placed three on other steamers since and they have proved entirely satisfactory.

Yours truly,

E. B. WILLIAMS, *General Superintendent.*

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Our Steamer "Helen White" was put into commission during the month of May, 1903. At that time there was installed on her a Carlisle & Finch 8,000 C. P. Search Light and on the strength of the satisfaction given by this light, we placed an order for a duplicate with your company on January 17, 1911.

Since the installation of this second light it has given us entire satisfaction.

Very truly yours,

UNITED COAL COMPANY,

Per W. D. BOYD.



Str. Helen White, Pittsburg, Pa.

The Carlisle & Finch Co., Cincinnati, Ohio.

PHILADELPHIA, PA., May 28, 1909.

Dear sirs — The Carlisle & Finch Search Light you put on "Ilse III" has been used for several years and has given perfect satisfaction in every respect.

Would you kindly, when same is put on the boat this or next week, examine it and see to it that it is all right for this season.

Yours truly,

ALF. J. KEPPELMANN.

The Carlisle & Finch Co., Cincinnati, Ohio.

NEW ORLEANS, LA., May 29, 1909.

Gentlemen — This is to testify that we, as well as our predecessors, have handled the Carlisle & Finch Search Lights for the last eight or ten years, during which time we have sold more than a hundred of these outfits, all of which have given satisfaction.

There is scarcely a steamboat on the Mississippi River or a launch in Lake Pontchartrain that is not equipped with one of your projectors. The demand for these is constantly increasing.

Assuring you of our entire satisfaction, we beg to remain,

Yours truly,

INTERSTATE ELECTRIC CO., LTD.,

EDW. JUMONVILLE, *Sec'y-Treas.*

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

ST. AUGUSTINE, FLA., August 13, 1904.

Gentlemen — The 1 K.W. plant has arrived in good order for the Florida East Coast Railway. I have installed same and it works fine. The railway officials are well pleased with it, and I will have a photo made and send you one of it in working order. We are using this plant to operate signal and semaphore lights in the railroad yards.

Thanking you for your promptness in getting this machine out on time, and trusting that I will hear from you regarding your letter to me of April 14, 1904, I beg to remain,

Yours truly,

IRA BLALOCK, *Electrician.*

19 Grove Ave.



Str. Virginia, Baltimore, Md.

The Carlisle & Finch Co., Cincinnati, Ohio.

VANCOUVER, B. C., July 3, 1908.

Gentlemen — We are still using your Search Lights exclusively on all our contracts, and have been doing so since the year 1897, and have yet to record a failure in your lights. Fully nine-tenths of all the coasting and deep-sea vessels entering the ports of Vancouver and Victoria are equipped with your Search Lights. They are built, mechanically, very strong, and the electric operating parts are free from complications of any kind.

Yours truly,

THE HINTON ELECTRIC CO., LTD.,

GEO. C. HINTON.

The Carlisle & Finch Co., Cincinnati, Ohio.

BOSTON, November 21, 1899.

Gentlemen — During the month of April of this year I received from you a 14-inch Projector, which was installed on the French Line S. S. "Pro Patria," and has been giving excellent satisfaction since. I found the lamp well made and very convenient in operating and installing.

I would like to have you send me one or two of your catalogues, and give me your best prices on an 18-inch, 20 to 25 amp., 110-volt Deck Type Projector, fitted with glass mirror, with case, stand and base of japanned iron, to hand control from deck. I should also like to know how quick a light like this can be shipped. An immediate reply will greatly oblige.

Yours truly,

HERBERT S. POTTER,

24 Commerce Street.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

MOBILE, ALA., July 22, 1908.

Gentlemen — Catalogue and prices received; thanks for your promptness. Kindly advise us what kind of shipment can we expect on a Form 1-C Plain Search Light, page 25, 19-inch, iron stand, 6,000 C. P.

In looking over the lists of boats that have your lights, I would like to let you know that every steamboat here is equipped with one of your lights. Of these boats I have sold and placed seven, and can say that all lights have given absolute satisfaction, and anything I can do to promote the Carlisle & Finch interest, refer them to us.

Yours truly,

HOLIFIELD ELECTRIC CO.



Str. Seandbee, Cleveland, Ohio

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURG, PA., April 1, 1905.

Gentlemen — Replying to your inquiry as to what we think of your Search Lights, beg to say that all our towboats are equipped with Carlisle & Finch Co. Search Lights, and we believe this will be convincing evidence that we favor and prefer your make of Search Lights over all others.

Yours very truly,

C. JUTTE & CO.,

Per G. W. THOMAS, Mgr., Towing.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURG, PA., March 30, 1907.

Gentlemen — We have used your Search Lights on quite a number of steamboats of late, with the best of results, and in 1904 we put one on the Steamer "Hidalgo," for Mexico, and one on the Steamer "Joe. Deitrick," for Newaragua, C. A., and are pleased to state that from recent letters received from the owners of these boats, your Search Lights are giving the best of satisfaction in every way.

Very truly yours,

JAS. REES & SONS CO.,

Per T. M. REES, Gen. Mgr.

ELECTRIC SEARCHLIGHTS.

The Carlisle & Finch Co., Cincinnati, Ohio.

SAN FRANCISCO, CAL., February 9, 1910.

Gentlemen — In reply to yours of January 26th, please be advised that we are now using the Carlisle & Finch Headlights on all of our steamers, and they are giving good satisfaction.

Yours very truly,

CHAS. R. McCORMICK & CO.,

By W. R. DEWIT.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURG, PA., July 19, 1906.

Gentlemen — The 19-inch Search Light was received and was put in place day before yesterday. This light gives me entire satisfaction. I have heard it spoken of within a radius of three miles of the institution in every direction. I believe that it is sufficient to advertise the place.

Yours very sincerely,

DR. J. ALFRED TUCKER.



Steamer Chippewa

The Carlisle & Finch Co., Cincinnati, Ohio.

CHATTANOOGA, TENN., January 6, 1900.

Gentlemen — Replying to your favor of the 22d ult., I am glad to say the various Search Lights I have used of your make have given universal satisfaction, and are, I believe, the most satisfactory Search Lights for steamboat use I know of.

Very respectfully,

THE TRIUMPH ELECTRIC CO.,

Per W. C. TEAS.

The Carlisle & Finch Co., Cincinnati, Ohio.

CHICAGO, ILL., 1902.

Gentlemen — I had an acetylene light, but yours is certainly the ideal. It is very handsome and does not give a bit of trouble. It is very economical in current consumption, so that I am not afraid to use it all I want to. I believe it will easily throw a light a mile, and its rays can be seen for a great distance around the country.

Very truly,

E. A. LAUGHLIN,

Chicago Yacht Club.



The William A. McGonagle, Duluth, Minn.

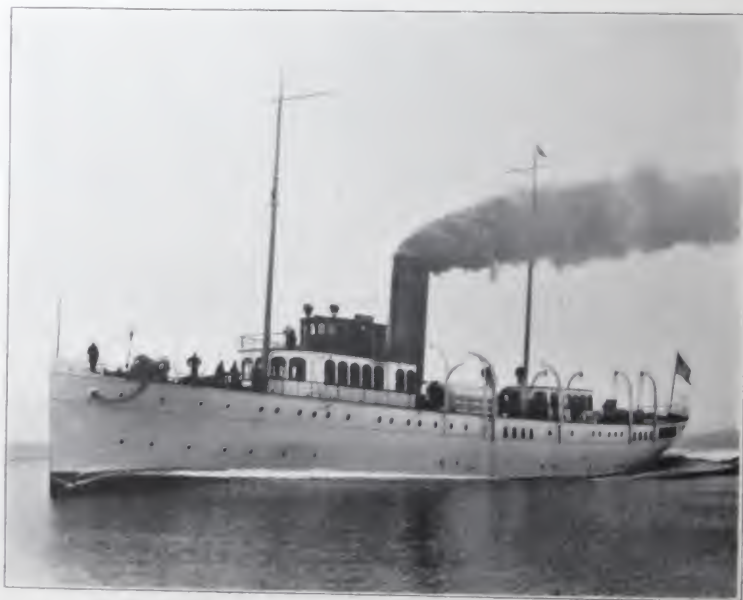
DULUTH, MINN., June 16, 1909.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen -- Replying to your favor of the 18th ult., we have just succeeded in getting a satisfactory photograph of our new fire boat, the "William A. McGonagle," and I take pleasure in sending you, under separate cover, a copy of this photograph. The Search Light furnished by your company is giving entire satisfaction in our service.

Very truly yours,

W. A. McGONAGLE, *President.*



Steam Yacht Cyprus, Owned by D. C. Jackling, Salt Lake City, Utah

ELECTRIC SEARCHLIGHTS.



Steamer E. R. Andrews, Campbell Creek Coal Co., Cincinnati, Ohio

PADUCAH, KY., December 30, 1902.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen—The Search Lights furnished by your company to the Steamers "Payonia," "Jim T. Duffy" and "R. A. Speed," give entire satisfaction, and we have now ordered one for the Steamer "Margaret," and think we will have balance of boats equipped with same in the near future.

Yours respectfully,

J. W. BOND,

Chief Engineer, Ayer & Lord Tire Co.



Steamer D. T. Lane, Campbell Creek Coal Co., Cincinnati, Ohio

ELECTRIC SEARCHLIGHTS.

DETROIT, MICH., June 18, 1904.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — The light you furnished us this spring for the Steamer "Buffalo" is working finely and satisfactory to the purchaser and we write to compliment you on the improvements, and especially the ruby glass sights in the drum for inspection of working parts without affecting the eyes. Might also mention that the "Owana," "Arrow," "Arundell" and "St. Ignace" lights are doing first-class work.

Yours truly,

THE HIRAM MARKS ELECTRIC CO.,
155 Jefferson Ave., Detroit, Mich.



NATCHEZ, Miss., July 17, 1903.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Please send us your price list on Search Lights, as we are in the market for a new light for this boat. Your light we purchased for our Steamer "Belle Prince" has given perfect satisfaction, never has failed to do its duty since put up. We have recently purchased this boat which had a Beufon light.

Respectfully,

GEO. PRINCE,

Captain and Manager Str. "Borealis Rex"

RICHMOND, VA., September 29, 1913.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — The 9-inch Search Light and Dynamo purchased of you some time ago has been installed, and I am glad to say that it has surpassed anything I expected in brilliancy. The light will easily pick bright objects one mile away on clear dark nights. The straight white beam of this lamp has caused a good deal of comment among boat owners in this neighborhood.

I would not be without a Search Light on my boat again for almost anything.

Thanking you for past kindnesses, I beg to remain,

Very truly yours,

WM. J. COWARDIN.

ELECTRIC SEARCHLIGHTS.



Launch De Soto, St. Paul, Minn.

The Carlisle & Finch Co., Cincinnati, Ohio.

PITTSBURGH, PA., July 20, 1914.

Gentlemen — Answering your recent inquiry as to the service which we obtained from your headlights, beg to state that we have four towboats in daily use, all of which are equipped with your Search Lights, and in each instance are giving entire satisfaction, and we can cheerfully recommend them to anyone in the market for Search Lights.

Very truly yours,

DIAMOND COAL AND COKE CO.,

A. R. Budd, Gen'l Supt.



Str. Huntsville, Huntsville, Ala.

ELECTRIC SEARCHLIGHTS.

PITTSBURGH, PA., July 23, 1914.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — Replying to your inquiry as to how we are pleased with your Search Light, would say we have our sandboats equipped with them and they are giving us entire satisfaction. We can recommend your make of Search Light to anyone requiring same.

Yours truly,

J. K. DAVISON & BRO.,

By H. S. DAVISON.



Str. C. M. Pate, Nashville, Tenn.

PITTSBURGH, PA., July 23, 1914.

The Carlisle & Finch Co., Cincinnati, Ohio.

Gentlemen — We are pleased to write you a recommendation for your Search Lights. One of our towboats, "Return," was among the very first at Pittsburgh to adopt your lamps. This was away back in 1898. Owing to the excellent service given by this Search Light, we equipped all of our boats, and are pleased to advise you that they all gave entire satisfaction. As convincing evidence of this assertion, when we were ordering equipment for our large new sand dredge boat, "Monarch," which went in commission last April, we had installed one of your 4,000 C. P. Form 2-C, 19-inch case Search Lights. It is very satisfactory, and would advise steamboat owners in need of a first-class Search Light to place their order with The Carlisle & Finch Co.

IRON CITY SAND COMPANY,

P. M. PFEL, President.